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A Farmer's Fifty Years
in Lauderdale



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Dr R. Shirra Gibb, 1923

[H. H. Cowan

[Frontispiece

A Farmer's Fifty Years in Lauderdale

BY

DR ROBERT SHIRRA GIBB

WITH A FOREWORD BY

SIR ROBERT GREIG, M.C., LL.D., F.R.S.E.

Chairman of the Board of Agriculture for Scotland

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NOTE

THE Author of this volume lived to complete the manuscript, but not to see it through the press; consequently the final personal touches have been missed.

For its subsequent arrangement, etc., his family is responsible.

FOREWORD

SOME years ago I suggested to my friend the late Dr Shirra Gibb that his leisure on retirement from Boon might be occupied by recording his recollections of his farming life in the Borders extending over nearly half a century. The result is this book which should appeal to a large circle. No one was better fitted than Dr Gibb to describe the rural life of the Borders and the farming of the past forty years. He was trained in science and a keen observer. He was an indefatigable and undefeated experimenter in farming methods. He was a judge of stock. He served on every public body of any importance concerned with the promotion of Scottish agriculture, and was a member of various local authorities.

He took part in Agricultural Commissions to Ireland, Denmark, Canada, and Australia, and thus extended his already wide knowledge of agricultural methods. Above all he was a man and a sportsman, and every aspect of the comedy and tragedy of country life found in him a genial observer or a kindly sympathiser. He lived, and farmed successfully the great Lauderdale farm of Boon, through the worst period of adversity and the greatest period of prosperity that agriculture has seen for a century. This alone entitles him to a hearing from every Scottish farmer. Every one who knew Dr Gibb, and many who never met him will enjoy these

reminiscences. Not only are they interesting to us to-day, but in years to come they will be quoted by agricultural writers as authoritative on the large scale farming of the Borders before and during the Great War.

But this is no dry blue-book. It is a personal record, an intimate description. We can hear the horses clattering into the stable at the end of a winter's day. We can see the ewes coming off the hill in the early morning and we can smell the sheep dip. It is all there, the picture of a Lauderdale farm, and the interests that are grouped around it. Stewards and shepherds, factors and proprietors, huntsmen and horse dealers, all were his friends.

It is the story of a man who "lived much" and enjoyed his life, one who was given to hospitality, devoted to farming, and diligent in public duty.

In due time this book will find its rightful place in the book-shelf of the countryman, side by side with that great farming classic *The Chronicles of a Clay Farm*.

ROBERT GREIG.

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A FARMER'S FIFTY YEARS IN LAUDERDALE

CHAPTER I

GENERAL REMARKS

FIFTY years is a long time to look forward to. This is the opinion of Youth. But Age says, according to the writer's experience, that fifty years is a short time to look back upon.

Whilst many of the incidents that occurred during the period may be forgotten, still, those that Memory retains—a succession of pictures, of fortunes and misfortunes, lights and shades of the past—may afford interest and amusement sufficient to warrant the writing of this volume. Any life, in a beautiful country—gay and even lively at times—may have incidents, in themselves anything but exciting when they occur but in retrospect taking on the glamour of the joyous past.

It is in one's early environment that a great deal of one's future outlook takes its origin, and that outlook may be very much modified, enlarged, or otherwise by the nature and temperament of the individual. I recollect a farming friend (as kind and good a friend as anyone need have) when talking over our country and our respective surroundings: "I honestly believe," he said, pointing to a beautiful spot at the head of a little glen, and in view of an

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old ruined tower and flowing water, "that if my house had been there instead of being on the bare hillside and close up against the byres and cattle courts, I might have been a much happier and better man!"

It is one of the evils of farming that one is so much, and so continuously, "up against it." How very happy have I seen my town friends when visiting me—their business cares banished for a time—getting up in the morning and going to the door: "What splendid air you have here! How beautiful the green of the country is! What a splendid view! That peep down the valley to the Leader is just lovely!" Or, even at another time: "The beautiful frost or snow!" It makes you, yourself, find it so for a short time, and you enter into the joy of your visitor. . . . Then, you recollect your sick beasts, your unbraided turnips, your lame sheep, or your unremunerative work, and your face clouds over and you would say—if it were not that you do not want to damp the ardour or affect the pleasure of your visitor—"it's all very fine, if it would only pay."

As my home had been in Aberdeenshire before I entered the farm of Boon it was naturally thought by some that I belonged to the North, whereas I claim to be a pure Borderer—purer in fact than many, for I was born within two miles of the Border. My father was a Borderer and belonged to Yetholm, a village there of which his father (my grandfather) was the minister.

Yetholm, on Bowmont Water, was divided by that stream into two hamlets: Town-Yetholm belonging to the Wauchopes of Niddrie, and Kirk-Yetholm to the Marquess of Tweeddale; the latter part was the headquarters of the Scottish Border Gipsies.

The first date of their settlement is not certain—but probably as far back as 1450 they were roaming about that country. I have read that the Gipsy family of Faa is mentioned in 1550 in a Writ of James V. as “oure lovit Johnne Fair lord and Erle of Utill Egipt”; also, that Jean Gordon, Scott’s “Meg Merrilees,” belonged to Kirk-Yetholm. In 1770, and 1780, and probably for many years before, Will Faa was King of the Border Gipsies, and when he died was buried at Yetholm. His great granddaughter, Esther Faa, succeeded him and was also buried at Yetholm in 1883. She was rather famous in her way, and from her wandering ways was well known. Out of interest and curiosity a very large company from all over a wide range of country assembled at her funeral. She is reported to have said that Yetholm was “sae Mingle Mangle that ane might think it was either built on a dark night or sawn on a very windy ane, the inhabitants maistly Irish and nane o’ her breed or generation.”¹ Charlie Rutherford, her grandson and successor, was not a credit to either his Irish or Gipsy parentage. Now, there are no *true* Gipsies in Yetholm.

My grandfather, Robert Shirra, was a tall, athletic man, his favourite walk being, *before breakfast*, to the top of “Stairaugh”—I have no doubt he would then be giving his next Sunday’s sermon to the Bowmont breezes, as at that time there would be no “read” sermons among Dissenters.

The family of Shirra came originally from Gargunnock, in Stirlingshire, where the name was Johnstone until one of them became so “good at settling the disputes of other people” that he was called “the

¹ “K. S.” in *The Glasgow Herald*, July 1923.

shirra," and this name stuck to the family. One of the family was the somewhat famous Robert Shirra of Kirkcaldy, of whom many stories are told. The family burying-ground is in the old churchyard on Stirling Hill, where my father and grandfather have mixed their dust with that of their ancestors. My father, George Shirra, became, when a young man, country traveller to a large Glasgow firm, and used to drive his gig over a wide district on both sides of the Border. On one occasion, after having been his rounds in the villages beyond Wooler, he was returning to spend the night with his parents at Yetholm, and, having entered the woods about Ewart, he noticed a light in front. Suddenly the horse's head was seized, and he was "asked for his money, etc." When he began to argue a little with his unknown assailants, one of the gipsies recognised his voice and called out to the others to "leave him as it is Young Shirra from Yetholm," and he was allowed to go on his way.

The Yetholm minister had married a lady from Aberdeen. It was said that she had had a sweetheart there who had not forgotten her, and eventually he left to her son (my father) some property, with instructions to take *his* mother's surname of Gibb. This is the origin of the name Shirra Gibb, and the connection with Aberdeen.

On giving up business my father took the farm of Lochtower close to Yetholm, so as to be near his parents, and there, in 1847, I was born. About ten years later my father went to reside in Aberdeenshire, where I was educated, graduating in 1872 at Aberdeen University.

In connection with the old Manse of Yetholm,

where my grandfather lived, I have many memories, but my reminiscences are mostly of his successor. I remember very well old Agnes Davidson, the manse servant. She had been with my grandmother for most of her working life, and even till she died was never called anything but "Nannie Shirra."

The stipends in these old days among "Old Light Burghers"—the moderates of the Secession to which branch my grandfather and the members of his congregation belonged—used to keep the house well garnered with the ordinary country foodstuffs in great variety. Besides eggs and butter there would be as gifts :

"Dunts o' Kebbock, teats and oo',
Whiles a hen and whiles a soo."

The *quid pro quo* of all this meant that anyone coming into the village during the week always called at the manse, where the common hospitality of the time had its full play. In order to meet this, Nannie, after breakfast, put on the big pot with what she would have as "stock" at the time, and any vegetables that could be got in winter, such as split peas, pot barley, potatoes, greens, etc., and in summer vegetables of all kinds from the large manse garden. The soup was ready long before midday and was kept hot at the back of the "swee." As the visitors arrived—whether they brought odds and ends or not, and whatever their errand—the big plate of Nannie's broth was their "hansel." The outspoken remark of one of them expressed the feelings of all : "Nannie Shirra's kail's baith flesh and kail."

CHAPTER II

PRELIMINARY

AFTER my studies in Arts and Medicine at Aberdeen University, and a short time spent in a law office, I had a few months' holiday. Part of this was spent on a Scottish tour during which I went from Deeside to Perthshire by Braemar and Glenshee. After a period of pure enjoyment at Crieff I spent a few weeks in Edinburgh and then took my course to London. There I foregathered with a lot of fellow students and friends, and after a most enjoyable time made up my mind to join one or more of them and spend the winter at a Continental Medical School. This I eventually did at Vienna, where the facilities at that time for practical medical work of all classes were unequalled and unexcelled in Europe.

About the beginning of February, in the "Krankenhaus" at Vienna, I received a letter from home saying that a big, good farm—which I had admired and often thought of—was To Let. It was of the nature and style that I was supposed to want.

I had just finished a Thesis on a phase of medicine in which I had been interested, and had got intimation from the Aberdeen University authorities that it had been cordially and unanimously accepted, and that it would qualify me for taking my M.D. degree when I had complied with the condition of having

had two years in private practice. Thus the time for decision as to what was to be the work of my life had nearly arrived, and the decision was not easy.

I went back to the hospital to examine a patient suffering from heart disease, in whom I was interested. There I met a fellow-student whom I knew. He was a very good fellow, Dr Arpad Gerster, a Hungarian. He also was examining the patient and remarked that he heard various irregular and unusual heart sounds. I listened for these, but only some of the loudest and most evident could I hear. When I told him this he said: "You do not hear very well. . . . Come with me, and we will go to Dr Arlt, and he will examine your ears."

Well, I was told by Dr Arlt that it did not seem to be merely a temporary dullness, and that, as it was undoubted that my hearing was not very acute, I might often miss some minute heart sounds, etc. Later, I tried all the heart-diseased patients in the hospital; some I could diagnose quite distinctly, others not so well. When this slight dullness had commenced I cannot say, but it decided me to give up the idea of practising my profession, and to take up farming instead.

I wrote asking my father to consult my "Authority"—which he would have done in any case—and offer what sum they thought right. Soon after I got another letter from my father saying that they had done so. Meantime, however, he gave me the offer of a well-known small estate in the same neighbourhood which was for sale at that time, but which would entail borrowing £6000 to £7000. For this sum, interest would have to be paid, and a house built

later. As an alternative to this he offered an Aberdeenshire property of which he was proprietor, extending to about 500 acres, the bulk of which, however, was not available until leases expired, or until arrangements could be made with the tenants. Lastly, there was the lease of Boon (the farm in question) inclusive of enough money to stock it, that is about £10,000 to £12,000. The next letter intimated that the proprietor, Lord Tweeddale, was inclined to accept my offer for Boon, and hoped for an early reply.

The die was cast, and Boon it was to be—and has been, under all the varying times and seasons for the past fifty years. Beginning at 25 I have finished at 75.

I am now occupying myself in putting down a few notes which may, or may not, be of interest to readers; they recall to me, as I have said, all sorts of memories—from the blythe and gay to the sombre and sad, of times difficult and easy and of times almost overwhelming to those in which life was worth living. I think that if I have any special characteristic among my fellows it is that I have not been more than usually downhearted in the worst of times, while in the better times—even though these were only temporary or not encouraging—I have been as sanguine and happy as the best.

On that February afternoon in Vienna, I had just turned to leave the hospital when I found myself face to face with a fine-looking old, white-haired gentleman who asked the way to the rooms of one of the professors. As I gathered he was English or American I answered him in the former language; later, I found he was an Australian. He asked me

to show him round the hospital, and as we got better acquainted told me the circumstances of his visit to Europe.

He was a prominent Infirmary and University surgeon in a large practice in Melbourne, Australia. He had had a very severe family affliction which had so affected him that, for some considerable time, he had been under the care of his fellow-doctors in Melbourne. These, on his partial recovery, had persuaded him to take the long sea-voyage to Europe, and this had, practically, completed his cure. After doing Naples, Rome, etc., he had come to Vienna. He had a great many letters of introduction to most of the big men in his profession in Vienna, Berlin, Bonn, Leipzig, Dresden, etc. He said he would gladly pay my expenses and give me the benefit of all his introductions, if I would accompany him on his visits and act as his interpreter for ten days or so, until he knew his way about.

I need hardly say that I accepted his offer. Next morning I introduced him to all the "lions" in the medical way who were in Vienna at the time, and to most of whom he had letters from his Melbourne Senatus. I then got my own class certificates all signed, and in three days we were in the train bound for Berlin. After visiting Bonn and Leipzig, I said good-bye at Dresden to as fine an old gentleman as I could have wished to meet.

After this parting I set out for home, and in the railway carriage found myself sitting beside a gentleman whom I took to be English. We had not long begun the journey to Rotterdam when we got into conversation. I found that he was a Dr Andrews, who had lost his health in his practice in the clay-flats

and marshes of Essex. He had, however, recovered considerably, and after visiting some of the interesting places in Holland—such as Utrecht, Leyden, Delft, Haarlem, Amsterdam, The Hague—was going home. Could I not go round them with him? As my old Australian friend had paid my expenses so long as we were together I still had some spare money left, and I agreed to accompany him. It does not take long to get about in Holland; distances are short, and, with one who turned out to be a most delightful companion, I thoroughly enjoyed the next few days.

Andrews and I, as Fate would have it, were destined to meet again and become much more intimate. As his lung trouble was, later in the year, giving signs of returning, he wrote that he was coming to see Scotland and visit me at Boon. He came to Boon and stayed there with us for a part of the summer. Eventually, he went to Australia where he settled, married, and had a family, all of which I learned from subsequent correspondence.

All this took place in 1872. About midnight, on a summer night early in October 1910—nearly forty years later—a long passenger express from Melbourne to Sydney ran into the station of the States frontier town of Albury, where the State railway of Victoria ends and that of New South Wales begins. A placard, on one of the saloon windows, indicated that its passengers were "The Scottish Agricultural Commission." A tall gentleman, with long, white beard, followed by some ladies, came up and asked for "Dr Gibb!" This was my old friend Dr Andrews of Holland and Boon in 1872. It had, of course, been reported in all the newspapers who the members of the Commission were, and also that they were to

be at Albury for half an hour while the engines of their train were being changed. The mutual pleasure in this little meeting was a most delightful experience, though short and in the middle of the night. It was a happy renewal of our former friendship. Later on I had the opportunity of spending a day or two with Dr Andrews' family before returning home, and also of meeting and entertaining his daughter, a great musician, at Boon, not so many years ago.

CHAPTER III

THE HIRING MARKET

I HAD parted from my friends at home in 1871 as a young, fully fledged doctor, and returned in 1872 the "Farmer of the large Lauderdale farm of Boon." As I arrived only the night before the first hiring market of the district at Earlston—on account of my journeyings with the Australian doctor and Dr Andrews—I was ushered into business without any preliminary.

Earlston hiring market has been, and still is, a very important day in the annals of farming in the immediate district. It is in fact the first hiring market of the year for married and householder servants for the whole of the South-east Border. What business in the way of wages is done there naturally indicates the rates that will be, more or less, current at the later markets in other towns of the Border country. In consequence of this a great crowd of people assemble on the hiring day in the little square and streets of the town. There were farmers who had come from a long distance, say, 15 to 20 miles, probably merely to gather what the current wages would be; farmers who, requiring the best, did not mind "flitting" good people a long distance so long as they were really good; some more inclined for other business; some to meet friends—all these were over and above the majority who

were there for the purpose of the market to hire ploughmen, etc., for their current requirements, and the farm-servants and families who were to hire. Besides these were the merchants, or their agents, in great numbers.

It was a "boom" time for them all. Farmers were, on the whole, prosperous. There had been rising prices for a succession of years for everything connected with the land, the result being that the market of 1872 was buoyant, and wages, for the time, ruled high. Considering the style of living and cost of necessaries generally, I fancy that the average farm-servant's family at that time was better off with his house, garden, and the equivalent of 18s. to 20s. per week, and better able to meet his current expenses, than he is now with 30s. to 35s.

I find that farmers nowadays when talking of wages have somewhat exaggerated ideas of the lowness of the wages in what is called the "old times." It was not so much the wages that were low as that other things—not merely one item, but nearly all—cost much less in money, and this, in the aggregate for everyone, meant that it was much easier then to keep going. At Earlston hiring—in 1872 at any rate—there was no agitation for shorter hours, and by hiring a good family one was assured of full time for full pay.

The farm-servants were householders to the extent of 90 per cent., the rest lived in the family of a householder. Accordingly, there were very few to hire of those who got fed in the farmhouse. It is not the custom of the country, except among the limited number of smaller farmers, so that some of the old rhymes, which one used to hear at hiring

fairs in Aberdeen, were very seldom applicable in the South, such as :

“ Wi’ could kail and tatties
They feed us like a pig,
While they get tay and toasted bread,
And ride intil their gig.”

Such songs were the beginning of social discontent and the origin of many things, leading perhaps to some of the Communism and Bolshevism of the present day. When houses are sufficient for the labouring population, and these get enough wages to allow them to live in moderate comfort, even Farm Servants’ Unions have no more support than they need.

The arrival of the “new” Farmer of Boon at the hiring market at Earlstoun about eight o’clock in the morning was, to some extent, an event of no little interest, and the thin, pale-faced, laughing, student-looking young man was pointed at as—“that’s the yin that’s gaun to Boon.” I was soon introduced to a little group of people intending to hire who were standing by themselves. These turned out to be the Boon servants at the time who were willing to stay on with the new master if suitable arrangements could be made in regard to wages. The new steward, “Jamie,” who had, on the advice of the “Authority,” been hired in advance for me, was in attendance on this little group. To him I was introduced for the first time, and few better men or more capable for the work required have I ever met. He was not very big, but, as I learned later, he had in his younger days been very “able” with his fists, and was still quite fond of occasionally displaying his powers. He had a pleasant, smiling face, and a

great sense of humour—I had the special power over him that I could always make him laugh. Eventually, I got a full complement of labourers, and all the houses filled.

When a considerable part of the farm-servant's wage is paid in farm produce, the total wage varies a good deal according to the season and the market price of the produce. It was understood he was to be content with the quality of the produce given to him as his "Gains" (the common name given to that part of the wage) so long as it was grown on the farm. In practice, however, he got the best, and on more than one occasion I bought in better meal and barley than we were able to grow on the farm for the "Hinds' Gains."

A good large garden, which went with the cottage, was dug and planted by the servant to whom it was to belong. It was customary, on a Saturday in April, to let the farm-servant who was leaving go for a day to the farm where his new home was to be, so that he might get his garden planted. If he had not already arranged for his seed potatoes and cabbage plants to be sent there in advance he could take them with him. A man who was well known would get plenty of help at dinner time from those who were on the place, but those who were less well known or disliked had often a pretty stiff day's delving and planting before them.

The cottages at Boon were fairly good, and, like all the other buildings at the steading, about eighteen years old. Each consisted of a good big kitchen, with a small bedroom off, and a large pantry; there was a large loft above with, at first, only a good broad ladder up to it, while the rafters were without

either lining or plaster. Here the young men slept, curtains of various materials and varied colours being nailed up round the beds. About twenty years later quite a large sum of money was laid out on these cottages. To each was built a porch, entering from which, but practically outside the house, was a milkhouse and coal-cellar. A good stair was made up to the loft, and two large skylight windows were put in, so arranged as to give cross ventilation, while the walls were lathed and plastered. The kitchen-chimney-side of the upper room made a nice warm place for the bed, and a large and most comfortable men's sleeping room was the result. In his Report to the Local Authority on Farm Servants' Cottages the Sanitary Inspector gave a plan of a Boon Cottage.

About fifteen years previous to 1872—about the time of the Crimean War—I recollect that the farm-servant's cottage consisted of one fairly large room (at the place I am thinking of, which was in Roxburghshire) with a door and two windows, the walls merely plastered and not lathed, while the open joists and rafters had nothing above but the sarking to which the slates were fastened. There were stone jambs at the sides of the fireplace but no bars for the grate, only recesses cut in the stone in which to put them. To make the house habitable lay entirely with the occupant. He brought with him posts, doors, and some boarding with which he partitioned off a small porch at the entrance; he then put up two box beds, with their doors to the kitchen-end, their backs forming the partition between the kitchen and what was to be the room-end. If there were any space left between the beds and the back wall

of the house that became the milkhouse or pantry. Sometimes there was a small window of one or two panes to the back, which was made use of to light and ventilate this pantry. Having finished the joiner work of his house he had to turn blacksmith and mason and adjust the bars and swive, which he had also brought, for the barless kitchen grate. Next, he produced his "Bennells." These consisted of large rolls of dried, blackheaded bullrushes (*Scirpus locustrus*) sewed and strung together so as to form light and fairly impervious sheets. These were put up as a ceiling for the two rooms, being tied to or hung from the rafters as was more convenient. The "Bennells" made wonderfully tough sheets, and a wonderful house altogether the man had made. Starting with the bare walls in the early morning and followed up by the goodwife as painter and paperhanger they brought light out of darkness, and comparative comfort out of nothing. The floor, which was generally of dry, beaten clay had to be levelled up in many parts.

About Term Day there was usually a school holiday, and as a boy I have watched these processes with considerable admiration and no little wonderment. I remember going to the top of a loch near my old home and seeing men with scythes wading in the water among the "Blackheads." At the time, I took them to be gipsies, and perhaps they were, but later I found out that they were cutting the rushes for "Bennells"; or, it might be more correct to say that they were cutting "Bennells" for making rush mats and rolls.

Was the word "Bennells" the common, local name of the rush, or was it the manufactured

product ready to put up as a ceiling or screen where required? The name "Bennell Moss," which occurs in various parts of the country where these fine, tall rushes grow, does not help much, as it was undoubtedly a common practice for farm-servants to get a holiday during dry weather to go to a "Bennell Moss" and cut "Bennells." After they were taken out of the water they were set up in stooks, and later carted home. I have not been able to find out if there were ever any right inherent to an estate to cut Bennells, or not. On many estates the servants have a right to cut peats on mosses many miles away. The above is, however, a somewhat long digression from the discussion of the "Gains" of a farm-servant in 1872.

In addition to his meal, house, and garden he had a cow which, in these early days, was generally his own, but for which the farmer undertook to give grazing in summer, and housing and turnips in winter.

CHAPTER IV

THE "BOLL" OR "GAINS" SYSTEM

I HAVE always looked upon the farm-servant's cow as one of his greatest assets, whether from the money point of view or that of the family's health and well-being. In fact, with a good wife he generally got the benefit of both. In this connection there were a good many interesting problems to solve and these got more difficult and complicated as the years advanced. Let us look at it first from the farmer's side.

The cow required practically 3 acres of the best old grass near the houses, and as much again if the pasture were inferior, say, at little above cost price, about £4, but, if counted with the possible profit that could be made out of 3 acres good grass it would be £6 at least; the wintering, turnips ($\frac{1}{4}$ acre), say, £4, 10s.; straw, accommodation and attendance, £1, 10s.; or, with the alternative of 4 lb. linseed cake for 180 days (say 7 cwt. at £13), say £4, 10s.; with straw, etc., as above the total came to £10 or £12. £9 was the amount counted at hiring time from the farmer's point of view, while from the servant's side there were few good housewives in those early days who could not lay past £10 even at the low estimate of, say, 6 lb. of butter at 10d. = 5s. per week, which for 40 weeks = £10. There would also be the skimmed milk and butter-

milk which were both excellent foods for the household. I have often known instances where farm-servants have been able to make half as much again as the above, so that it was well worth while for some of them at least to keep a cow.

The reluctance in after years on the part of the farmer to keep a cow would be begun by the servants themselves. They "could not buy the cow," which in some cases might be interpreted as meaning that the wife was too lazy to milk it. They wanted £8 or £9 instead of the cow, and they got it. The farmer thought that by such new arrangement he would get more than £4 for his grass, and maybe he could, not having the welfare of his people much at heart. I have often thought that the farm-servant's cow was as nearly an ideal arrangement as could have been expected, but unfortunately it needed ideal servants, ideal masters, ideal cows, and ideal management to make it the success it should and really might have been. The position now is that very few farm-servants' wives know how to milk a cow, and fewer can make good butter. They gave up keeping cows practically of their own account; the cry got up for an "all money wage," and, as it was simpler for the master of a big farm, they got it. So away went the cow and with it the milk, and now, on many farms there are hardly any cows and no milk at all.

I know a farm with five servants' cottages, the school children from which carry out every afternoon a tin of milk from a dairy in a neighbouring town for the use of the farmer and his family. A proprietor's family, not far from here, require a regular supply of fresh butter, having got tired

probably of margarine though called butter. The dairy farmer who supplied their milk was applied to, but, having a good whole-milk trade, replied that it could not be done at anything near market price, and recommended their getting it from somewhere in the West country, such as Dunragit, etc. His point was that it takes $2\frac{1}{2}$ gallons of milk to make 1 lb. of good butter, and with the average price of milk for the year at 1s. per gallon the butter would need to be priced at 2s. 6d. per lb. in order to pay for the milk, even omitting the cost of separating, churning, etc. Where a whole-milk trade is possible it won't pay to make butter. Much of the butter collected from the average mixed farm when retailed in the shops has already lost its freshness. Owing to the slovenly methods employed such butter must be eaten as soon as churned, *or never!*

For thirty-five years I have, along with others, organised buttermaking classes all over the south-east of Scotland. The average attendance at these classes has been probably 8 to 10 with an occasional farmer's wife or daughter, but hardly ever those of a farm-servant. Those for whom the classes were intended were, in many cases, too proud to learn, and the few who do have cows or have the milk of cows belonging to the master continue to work on the old lines. They keep the cream until it is fit only to churn into very third-rate butter for which the merchant gives them a price in return for their custom. Even though I have never refused to "put on" a cow to a farm-servant when asked for one—on the chance of the family getting some of the available milk, I have come to look upon the whole of what I have called an ideal position as being absolutely

hopeless of attainment. The only way in which the farm-servants' families can get a proper supply of milk would be through an increase of dairying and the delivery of milk from dairy farms all over the country.

A few years ago I required a shepherd, and went to see one who had applied from the east side of the county. I had every reason to think that he was a very good fellow in every way, and he had a strong recommendation from his master. When I asked him why he wished to leave, he replied: "Oh, for nae other reason than that we canna keep a cow, and canna get milk. Believe me," he said, "that the milk used, and there's no' much o'd, comes out the seven miles in a milk-cart from Berwick!" (I was glad to notice in the Sanitary Inspector's Report that there had been an increase of 9 for this year in those registered to sell milk, and there are now quite a considerable number of names on the registered dairy list.)

The next important part of the "Gains" was the Potato Ground. It is the only one that still continues in common use of the old "Gains System," which was really a "sharing" system. It may be called a "truck" system, or a "payment in kind."

The wage of the householder now is so much per week, a free house, and "potatoes." According to the custom prevailing in the early days, and to a great extent still, that meant ground on which to grow potatoes—the farmer giving the horse labour while the servant gave other labour and also the seed. The custom of the times has modified this so that the farmer now does everything except provide the seed. The change came when holidays were

more fully recognised as the servant's right. At planting time he took a holiday for the purpose of putting in his potatoes; when they needed hoeing, another holiday, and the same at "howking" time. So, in the end, the farmer did all the work. In many places, nowadays, the "potato-ground system" has itself been abandoned, and in its place "so many bags of potatoes" are delivered at the servant's house door, and in this way he is relieved of all further trouble. The servant is also relieved of any loss should the crop be a bad one but, similarly, he does not benefit in the event of a good crop.

I do not think we were very particular about averages long ago—at least I have lost all records of these—but during the last twenty years the average for the householder would be about 30 cwt., *i.e.* 1500 to 1600 yards of a drill, or approximately quarter of an acre. The potatoes were carted home from the field and pitted in a "clamp" in the cottage garden. They went a long way towards the feeding of the household and of the pig—plenty of potatoes, some fat pork or ham, and plenty of milk and bread make a very good meal.

The question of holidays formed a subject of agitation for many years. It was, however, to a great extent started and continued by outside agencies and not among the ploughmen at all, but naturally, when they were put up to it, those who did not join in the cry were looked down upon by the others. What was aimed at was not really so much a demand for off-time as for a recognition by the farmer of the right to let the men have holidays. The women were generally allowed a day off except when special work was going on; the time of their "holiday" was

then deducted at paytime, so that they practically had holidays whenever they wanted them. On the other hand, while promised constant work—except in very wild weather—they had neither the full time nor the full pay of the men. I think that on two occasions only, during the whole fifty years of my farming life, had I to tell the steward to send the women home as there was nothing for them to do ; both times were during deep-lying snowstorms.

I had a very good ploughman, who may be said to have almost commenced with me at Boon—he came in 1873 and was with me for twenty years ; most of his sons and daughters also began work with me during the same time. He was rather a silent man but he was impressed with the idea that he and the others should have the *right* to a certain number of days' holiday in the year. In 1886, or thereabouts, I offered to put it in their written "bargain" that I would give them from ten to fourteen days' holiday in the year—including a day for funerals, hiring day, and New Year's Day, and the other days when asked for provided we were not specially busy on the farm.

Well, we had got the turnips all sown and the horses out to grass when, one evening, Dave (David was his name) came to see me.

"Well, Dave! What's up the night?"

"I'm gaun to take a holiday."

"First rate, Dave ; this is the very time. Are the wife or any of the bairns going with you?"

"No, no, I'm gaun my lane. I'm gaun to Dumfries. . . . I've a cousin there I havena seen for a lang time. . . . I'll be away for a week."

"Dumfries? That's a long road. Aweel, take

your full week and start in the morning. I'll no' expect you back till night on Monday week. . . . Bide till I get some siller for ye. . . . Ye'll need it gaun sae far." (The wages at that time were paid half yearly and not in advance.)

"No, no, I've plenty siller; they'll have mair need o't at hame."

"Well, good luck, Dave. I hope you'll have a good time."

Dave started next morning, and two or three times during the next few days I thought about him, and wondered how he was getting on because these people were not so accustomed to travelling then, as nowadays. On Thursday morning I happened to be taking a look at the place where the men were doing some carting, when to my astonishment there was Dave back with his horse and cart.

"Hullo, Dave, you've got back! How did you find your cousin? I hope you had a good time?"

"Oh, aye. . . . Come on, Jean!" (to his mare) was all the answer I ever got. I happened to see Janet, his wife, in the course of the forenoon.

"So you've got Dave back, sooner than you thought?"

"Noo, Maister, ye maun-na' laugh at him. I canna tell ye what's happened, but he got tired. Ye see his cousin wadna' have a holiday, so he was bound to feel lanely a bit. I'm jalousin' that's it. . . . He hasna' telled ony o' us."

After that incident the servants got a little more accustomed to holidays, but there never was one in good health who took his full number of days' holiday until the fixed holiday, Saturday, came into general use.

It would perhaps be outside the scope of these reminiscences to record one's own opinion of the half-holidays, or the half-Saturday holidays now in vogue. So far as young men are concerned, who bicycle often long distances, it may be enjoyable enough, especially in summer when Games, Shows, etc., are, more or less, made to suit them. To those, however, who have passed their youth the period between 11 o'clock on Saturday forenoon and 6 o'clock on Monday morning seems often a tiresome time. It is all the more so because it is an "enforced" holiday. Although there is plenty of work to do, generally it does not get done because of the awkwardness of having only a few of the staff at work. Nor are the horses any the better of the long stoppage; very careful feeding and attention are required with them to prevent thick legs, colic, and other troubles.

Time, however, brings its adjustments, and possibly the average hind manages to get more enjoyment out of his life than his parents did, though it has to be borne in mind that it is at more cost to himself—there is the bicycle and its upkeep. Even when he carries a "bite" with him when he goes from home, there is always some little money required. One's Sunday clothes or boots do not last so long when they are worn every Saturday instead of lying in a drawer. I do not think that the half or whole holiday on Saturday has resulted in as much more gambling and drinking among farm-servants as one would have expected, and I can bear record that those of to-day are as well behaved as their fathers were in a former generation. This is the case in Lauderdale at any rate, though they do not work as well as Dave and his companions did in their day at Boon.

CHAPTER V

WAGES

As any table giving the changes in wages during the various years from 1872 to 1922 would not only complicate matters but would be a difficult thing to show in a simple and understandable way, a general survey will be clearer and better.

At first, the cash actually paid to farm-servants was only a part of the wage, the other part being the "Gains," and both varied from year to year according to the markets. For some years after 1872 wages rose slightly each year, especially in the case of servants re-engaging for a second year or longer.

Features of the earlier years were the "Harvest Wage," and "Harvest Meat." The harvest wage varied slightly from year to year, and, in the Valley, was fixed generally at "so much below what was current at the Market for Harvest Workers held on 5th August at St James's Fair, Kelso." Prior to 1873, 80 per cent. of the grain crop was cut with the sickle, and this required a large extra staff. It was customary for most of the rural population to "take the harvest"—even from the villages, blacksmiths, joiners, and other tradesmen, with some of their wives and daughters, would engage with the

farmer nearby for the corn cutting, and some of the men would include also the carting in.

The "Cutting" took from three to four weeks at 28s. to 30s. per week for the men, and about 25s. for women, besides food. Food consisted of porridge and milk in the morning, a "Shearer's Bap" (about a pound of baker's or wheat bread), and a quart bottle of harvest beer for dinner; for those who could not get home at night, porridge and milk again. For the "home-goers," who could get what they required at home, "Supper Barley" ($1\frac{1}{2}$ bushels of barley per worker) was delivered at each house before harvest began, or it was arranged to be sent later. The baker and the brewer delivered their consignments at the farm, the bread every two or three days, and the beer usually weekly in 20 to 30 gallon barrels, and there it was bottled.

In those days the harvest was no sinecure, and the harvest "meat" and "wages" were looked upon as a large and legitimate addition to the servant's yearly resources. A great deal of milk was, of course, consumed with the porridge, while, as some of the women drank it instead of beer for dinner it often happened that *all* the milk produced on the farm was required. Such milk as came from the servants' cows had to be commandeered and paid for at, sometimes, up to 9d. per gallon, for the milk got scarce at that season. Those who had cows "put on" instead of their own animals were applied to first, and occasionally it was arranged, when the servant was hired, that this would probably be done.

On an extensive farm like Boon the "harvest labour" question was a large one. The harvest of 1872 was a very wet one, and with a 400-acre crop

to handle we had a very trying time. Sixty-three people were at work one half of whom were Irishmen coming direct for the harvest, many from the west of Donegal. There were also the men who had been draining on the farm all summer; the others were my own servants and odd men or women living near who were willing and able for work. The Irishmen were each provided with a good blanket and they slept in the bothy, in the byres—which were cleaned out and littered with straw—in the barns or in the lofts. Their expenses were small, and many were able to put in a first harvest in the Merse, at the sea-coast, or on Tweedside, besides one or more harvests later in higher parts of the country. They went about the countryside in bands of from five to ten men or more, and were usually civil and well behaved, though occasionally a few gave a good deal of trouble. After a wet summer there was generally a bulky crop, and prices were high for cutting, “by the piece”—18s. or more per acre was quite common. Many Irishmen were, even in these early days, able to return to Donegal with £8 or £10 in their pockets, which, with their crofts and occasional fishing, would “keep the wolf from the door” during the winter.

The Irishmen who had been doing draining work on the farm in spring and summer might be called residents, though actually they were of a more migratory type. Most of those who came at first for the harvest alone belonged to the north and west of Donegal, about the Gweedore country, etc., and as a rule were good fellows. Men like the M'Brides, Denis Curran, and Conn Doran were always welcomed everywhere. They came regularly,

year after year, and, as I have mentioned above, did several harvests in different parts of the country. In succeeding years the Sweeneys—father and four sons—came on the scene, arriving about July to help with the potato and turnip hoeing, as the farm out-workers were not as plentiful then as in earlier years. Then the father became too old, while the sons went abroad or got other work. Still later, I had several Gallaghers from the same district in Ireland who were good workers when sober, though one or two were not always as fit as they might have been.

When in Ireland in 1906 with the Scottish Agricultural Commission, of which I was a member, I extended my tour and visited those people in Donegal. As the main body of the Commission was returning to Dublin from Castlerea, I left them there and hired a "car" to Ballaghaderreen. There I got a train via Sligo, Enniskillen, and Strabane to Londonderry, and had a beautiful journey in fine weather. Next day I took train to Gweedore, and in a pony trap drove round by Bumbeg, Derrybeg, and Carrick to Bloodyforeland, west and north of the Derrydeagh Mountains, where I saw quite a number of my old harvesters. The Sweeneys and others were living their life in their own homes in this wild, rocky, and sandy country. Old Hugh Sweeney was called the "laird," and his house was one of the best there, although it would not have been even *looked at* by hinds at Boon. He had about 30 acres of land adjoining, half rock, half sand, but all poor and worn-out. As their "fishing" in the stormy seas cannot have been of much profit to them either it is no wonder that they came seeking work in Britain!

The settlement of wages was half yearly, and

these were paid out by the farmer himself at Martinmas and Whitsunday, although it was quite common for a servant to ask for some money, for himself or for his outworker, between terms. The "Gains" were generally given when required, or else so much of them monthly or quarterly. This was done by the steward and entered in a "Gains Book" which he kept for the purpose. In 1875 I began paying the outworkers monthly.

Prior to 1872 there had been much controversy about what was called the "Bondage System," which, although in common operation up to that time, was, as a system, now defunct. It was quite usual for a householder who could not supply an outworker from his own family to undertake to hire, and to have living in his house, a girl or boy who would work out for the farmer. In the old days this girl or boy was called a "Bondager." She, or he, received the customary wages of an outworker and, in addition, the farm-servant got, say, 200 yards more potato ground, and perhaps more meal, barley, or other perquisite. When this system was not done quite willingly on the part of the householder there was not much to be said in its favour, but, in my experience, I have never known such a case to happen. Two well-doing men—who were boys with me hired under these conditions—now have farms of their own, and are intimate friends of mine. It is, however, usually possible to hire all the outworkers (women or boys) required along with their parents. During my last year at Boon I had a father, son, and two daughters; and another father, two sons, and one daughter, and was able to give two houses each to each family. Outworkers,

women especially, are a feature of the S.E. country, and are generally good workers with good wages. They still get 20s. to 25s. per week, whereas in 1872 9s. per week was the maximum, but the latter did not include harvest meat, which came to about another 50s. It must be borne in mind that the harvest then was quite a different job to what it is nowadays.

About 1880, with the fall in prices of grain, it was felt that, while the farm-servants had been making the most of the harvest wages and harvest meat, the change in methods of harvesting, the general introduction and more efficient working of the "Reapers," and later of "Binders," indicated a change also in methods of payment. A movement was made to do away with harvest wages, and also, when possible, with a part of the harvest meat.

I find that I hired some families who were to get £1 per week for harvest and £1 *in lieu* of harvest meat. By 1882 we were hiring everyone without harvest wages and only *dinner in harvest*. For about ten years, 1880 to 1890, wages for men were on what was called the "Lauderdale, or Small Boll Wage." This worked out as things were then, thus :

Free house and garden	£4
Coals, driven	2
Money, according to the qualifications of the man, and the number of outworkers he could supply, £18 to £22, average . . .	20
1200 to 1600 yards of potato drills, 35s. to 45s. average	2
A cow's "keep," or a "put-on" cow and keep	9
65 stones of oatmeal	8
18 bushels of barley	4
<i>In lieu</i> of dinner in harvest	1
Say	<u>£50</u>

Prior to the above, in 1875, I had hired a "Double Hind" (two ploughmen in one home), one, the father, at the "Big Boll," or "Kelso Boll" wage—that is, 100 stones of oatmeal and 4 bolls of barley (instead of, as above, 65 stones and 18 bushels respectively), which at average prices would be about £50; the son was also at £50. In the following year another man got a "Boll" which worked out then at £53.

By 1878 and 1879 the average wage would have risen from £3 to £5 above that of 1873, for the most part on the same amount of "Gains," but often there was a substitution of so many shillings per week up to 15s. according to the perquisites asked for. There was a big run in harvest wages which had to be considered. During these years, wages would be at the maximum, and when the "eighties" began there was not much general fall; what there was was mostly in smaller matters such as coals, food in harvest, etc. On the whole, the expenditure in wages remained about the same, and the fall for say fifteen years, between 1873 and 1888, would not be more than £3 for good servants, or £5 for the most "shiftless," *i.e.*, not only those who were slackers themselves but also those who were continually moving from place to place.

A Steward received the same in gains or perquisites as a Hind, but from £5 to £8 more in money.

A "Cottar" is an outworker who has no other farm-servant with her, and who gets a house, garden, and generally some potato-ground in the field. Cottars are "double" when there are two outworkers; "single" when there is one only. Their general wage was, in my time, the same as the ordinary outworkers, but it was rather an extravagant way of getting the

work done, since, besides the house and garden, there was usually more potato-ground than would be required if the ploughman were supplying the worker from his own family. On the other hand, by having a cottar, one was able to hire a good single man in his prime at a moderate wage, instead of an older man, or one just beginning, at a high wage, because he had the much-needed outworker or outworkers. These cottars came to be very much sought after at the markets, and, owing to their scarcity, were given higher wages. Then, as all outworkers' wages had to be as nearly as possible the same, they gradually rose in the "nineties" to 10s. per week, and to 10s. 6d. for extra strong good women.

The "Boll" or "Gains" system was by this time fast dying out, and, except for farm-servants with large families, the money wage—with cow when asked for—and field potatoes or potato-ground, was becoming the common style of hiring. Instead, therefore, of the oatmeal, barley, etc., and say £20 in money, it came to be free house, so much potato-ground, and 16s. a week, with a reduction of 3s. if the servant had a cow or wished to have one.

About 1895 the Holiday question became a feature at the hiring markets, and, in my Records, I find that I made an arrangement with my people for eight or nine days' holiday in the year taken at any time they asked for it except when very inconvenient—with the use of a horse and cart or other conveyance if going to a distance. The latter was much appreciated but was not often taken advantage of.

Between 1900 and 1910 all wages rose, and were paid monthly; the gains or perquisites, except the potato-ground and occasionally the cow, having been

abandoned. An odd servant or so would sometimes bargain for 10 stones of oatmeal for porridge for the family, and it was difficult to refuse this. A house and garden with potato-ground and 18s. per week became the common wage, or 12s. for outworkers, who were, generally speaking, very inferior to the old class. The harvest wage and harvest meat were also given up.

From 1910 to 1913 the rise in wages would be equal to 3s. per week and 1s. for outworkers.

During the War, the rise in wages is in practically everyone's memory, and the extension of the hours of holiday has naturally altered the whole conditions of service.

In 1915 the current wages for ploughmen and spademen were: potato-ground and 28s. to 32s. per week, with a deduction of 5s. per week if a cow were kept; the outworker got 20s.

In 1917, under the same conditions, wages were up to 34s., outworkers 21s.; and in 1919 they rose again to 40s. for men less 7s. per week for a cow's keep, and for outworkers 24s. to 25s.

In 1920-1921 wages again rose to 44s. 6d. per week for men, less 9s. cow's keep; outworkers 30s. Now, in 1923, the normal wage is about 10s. per week below that maximum.

The War put this matter almost entirely into the hands of the farm-servants and the hours came to be 2620 per annum, made up thus:—

A 9-hours' day for 52 weeks	=	2808 hours
<i>Deduct</i> 42 half-holidays	=	188 „
Total . . .	.	<u>2620 hours</u>

which had to be worked to the exclusion of all meals and evening stable time. It worked out thus :

8 winter weeks .	at $44\frac{1}{2}$ hours (average)	=	356 hours
34 weeks .	„ 50 „	=	1700 „
6 weeks' "busy time" .	„ 54 „	=	324 „
4 weeks' "harvest" .	„ 60 „	=	240 „
Total .	.	.	<u>2620 hours</u>

For stewards and shepherds the hiring markets were in January, *i.e.*, it was the practice to hire them about five months before they were required, which was not till the 28th of May following, and at least two months' earlier than any other class of servants. I do not know why there should be this long time but, when it first began, it was probably due to some better reason than mere custom.

Shepherd's wages were usually on the "Share" principle. He had so many sheep of the same kind as his master's, *i.e.* ewes and hoggets, and for them he received their "keep," the lambs, wool, etc., being sold along with the master's, though there were exceptions to this. In the earlier days this "Sheep Wage" was almost universal but later it became less common. In practice it meant that the shepherd was himself a stockholder and a man of some means. There were, however, other points to be looked at in connection with it.

As the shepherd's own sheep were grazing and going alongside the master's neither was likely to be neglected, while, as all farms and farmers are not alike it was more difficult for the shepherd to leave, and at the same time secure another place equally

suitable. Thus, only a small proportion of the best shepherds were to hire.

My first head shepherd got 100 stones of oatmeal (he required a lot of this for his dogs), 18 bushels of barley, potato-ground, a cow, and the "keep" of 15 half-bred ewes and 4 hoggets. The second shepherd—as good a man as himself—had the same "gains" and £16. When it became known that my sheep—and therefore the shepherd—were "well done by," my next man had 3 ewes fewer to begin with, but eventually got up to 15 ewes. Then, as times got bad, they had only 13 ewes, 14 half-breds, and 4 hoggets; and 18 ewes and 5 hoggets. Still later, things having improved, the shepherd took Cheviot sheep up to 24 ewes and 6 hoggets, and even as high as 26 ewes and 8 hoggets, besides the ordinary "gains."

CHAPTER VI

THE ENTRY

IT is more or less the custom, or is necessary, that when a young man enters a farm he should have someone of experience to direct, advise, and generally help him, and of these I had no lack. But he whom I am calling "The Authority" was above all others.

A tall, nearly clean-shaven, bald man with small side whiskers and somewhat classical features, he had a stoop from the middle of his back, the result of attacks of lumbago. He was not given to smiling—except when he was getting the better of you, or showing up one who had got in the wrong somehow. He was neither a talkative man nor a reader, and gave one the idea that, in his view, few writers were worth the time spent in looking at their works; what he did read was merely for the pleasure of criticising, or of strengthening his preconceived notions, and increasing an already abundant opinionativeness which was generally sufficiently evident. At his own home, after going over his farm in the mornings as far as he wished—to do which he used to ride on an old "Galloway" (the common name of a pony then)—he would sit down in his two-armed, straight-backed chair at the side of the fire, open a letter or two—his correspondence was not large—take up the

Witness or other such paper for a short time, then relapse into his usual vein of profound and, to outward appearance, self-satisfied meditation. I have known him sit for hours in this reflective mood, varied only by occasional grunts if some member of his family or the maid entered the room.

There was, however, another side. He was generally considered to be, as he was, a very shrewd man. His reflections had resulted in a mind well trained to give invaluable advice in his own and kindred lines. Though not much of a social success, he was recognised by many as an adviser in a thousand, though a little difficult to approach. A man of upright character, a good husband and father though probably not what, in the usual way, would be termed a loving one—love, as generally understood, was not much in his way—he was a regular church-goer, though his religion did not seem to be limited to that but pervaded most of his life.

Such was my “Authority,” my head adviser, not in the minute details of my work but in the larger matters of rental, stocking, and general cropping, and his advice in all these things as it appealed to those who knew was undeniably sound. Though he has long left us, with the rest of his generation, I can heartily thank his memory for very many kind actions, and also for others, possibly meant to be kind, which did not prove so happy.

I recollect a notice coming to me to the effect that there was a large quantity of wheat-flour—large at least for one household to get at one time—at the station addressed to myself. On making inquiry I found that my “Authority” had sold some wheat to a miller and, possibly to make the bargaining

easier, had ordered a lot of the flour; then, in order to get quit of it, had instructed that some of it was to be delivered to me. At the time it happened that the members of my household were like those of the "wee Cooper of Fife"—"they wadna' bake and they wadna' brew"—so the flour was largely used as pig food, such of it at all events as was not spoiled. Even now (and perhaps now more than ever before) one's household arrangements do not tend to make life easier; brewing has long since been given up, while baking and other branches are going. I was coming south by train not very long ago when a decent-looking man came into the carriage at Kirkcaldy. He showed just the least bit unsteadiness in his legs and had an unnatural twinkle in his eyes. After trying to get up some sort of conversation with the other passengers he sat down next me. The train had not started from the station, and just opposite the window was a "Monkey Brand Soap" advertisement. My friend nudged me with his elbow and, pointing to the advertisement, read: "Won't Wash Clothes," adding, with a somewhat sorry grin: "My wife's like that!" Perhaps in the North we fed more upon oatmeal porridge, bannocks, and cakes than on wheat flour. It was not always even in those very early days the case that money would buy an efficient domestic service.

During my first year my "Authority" paid me repeated visits and always gave me sound and well appreciated advice. I have thus devoted a page or two to one who was largely responsible for most of the good things which I did, and many of the most useful. He could not be counted as responsible for many of my wilder schemes, some of which he would

meet with his rather rare supercilious smile, and ask if I "thought they would pay."

Who could judge, at that time, that the untrodden wilds of the Far West would answer the question in the negative in such an emphatic manner as it did twenty and forty years later, becoming even more emphatic and more supremely negative as time went on?

It was a very lovely morning in the end of May! The sun was shining beautifully through the delicate haze of the early hours; the birds were giving of their best. Two blackbirds, having got over their work of foraging and feeding, were vying with each other on trees about twenty yards apart in the production of the richest, longest, and fullest song, such only as those reared in purely country places can supply. A mavis, which had probably in mind the possibility of beating them at their singing, scurried away with a chirp and a chuck among the laurels as I came along. A cheeky little cock-chaffinch drew attention to itself in the hedge, and whole hosts of birds of great variety seemed to be hopping and flitting about, rising here and alighting there, twisting their necks, shaking their tails, and preening their little bodies—a welcome? or out of curiosity? I am afraid the latter. Certainly none of them were in the least afraid.

The Spring had not been so very unkindly as it sometimes is, and, as I walked along, the fine green of the paddock pasture, the beautiful light, flickering leaf of the birch-trees, the gorgeous flowers of the rhododendrons just looking out, with the dark green of the Portugal laurels and their budding flower stems—all were so complete and simple in their way, so

beautiful as a whole, so natural and so fine, that a glow of entire satisfaction was the feeling which remains with me through fifty years.

I recollect that first morning and the walk through the shrubbery to the farm-steading as if it were yesterday. However beautiful and enchanting the scenes, however satisfying the memories, the realities of life have to be faced, and those should be thankful who can throw off the real and can occasionally recall the ideal; who can leave the worries behind and revel in the sights and scenes of Nature's brighter side.

The steadings were reached about a quarter to six—the birds and birches had to be forgotten. There was the old steward, "Jamie," who had just arrived the day before. He looked rather glum as he came up to me and said: "Maister, there's a horse no' weel!" In my best Aberdeen-English I asked which one it was (of 19 newly bought) and what was wrong? "Eh? What dae ye say? Come and see't. It's like the bats." Whatever it was—and a young doctor should have known—the horse died a few days afterwards. I don't think it died because its master was a doctor, but one never knows!

Behind Jamie, the Steward, there were ranged nine good, strapping ploughmen—fathers and sons—and an equal number of big, strong women and boys; these were the dwellers in eight cottages not far away. The men were mostly in new moleskins and sleeved waistcoats; while the women and girls wore short, strong, woollen petticoats, nice clean cotton bodices, a big bonnet to keep the sun off, and strong stockings and boots like those of the men. The bonnet was only for summer wear and, not very many years

afterwards, gave place to the big straw hat trimmed with an abundance of frilling which they now wear. These farm working women were, and still are, though to a lesser extent, the feature of the labour department in arable farming of the south-east of Scotland.

The whole body of servants looked, what they were, a most capable lot as they met one's eye collectively for the first time since the February hiring market where they were engaged. Whether from curiosity or some less explicable reason, a New Tenant, as in this case— young and unknown in a large hiring market such as Earlston—has generally not much difficulty in getting farm-servant householders to suit him. A father ploughman, as Ploughman-steward, with two daughters to “work out”; a good second ploughman—a father with two sons all three being ploughmen and a girl “Learner”; two sons whose father was dead, with mother to keep house and work out when wanted in busy times; a Cattleman—father with boy and two daughters; one single ploughman with wife to work out, the mother keeping house; two middle-aged men—one a ploughman the other a spademan—and boy (sister works out when wanted specially and keeps house, etc.). So the eight houses were filled and the full complement of the staff was made up. Other three houses served for the shepherds and the steward.

This was the lot which crowded round the work-stable doors behind the Steward on that eventful morning as I went inside to see the “no' weel” horse. Some of them might probably have expected that I might say the word and up the horse would get, quite well, for I knew that my fame as a “skeely

Doctor " had already been noised abroad on account of my sitting up at night with a croupy boy who had got better. The horse, however, had not as much sense as the little boy.

I was always in the habit of giving the Steward his instructions as to the work to be done, and leaving to him the details as to who should do what, as well as the giving of the orders to the special individual. So, on that first morning, after discussing with him what was the work on hand, and letting each man see the pair of horses he was to work and the harness for them, " Jamie " was not long in getting them all out to their own special jobs. He was a past-master at that part of his work, and, in after years, continued to evoke my perfect admiration for his powers over his fellow-servants and the details of their special work.

Though originally brought up on a farm I had not had the first-hand practical experience of most of those who were so brought up. It was therefore some time before I took that part of the work on myself. It has always struck me, however, as being much more difficult than it looks, and needs a bit of practice to go along a stableful of men and women and horses and tell each man or woman what he or she has to do.

For instance, to the ploughman-steward to take his plough to the Mooryrig field and plough-in the old furrows ; and tell the second and third men to do the same. There would be new horses you could not be quite sure of : would they all go in carts ? Would they all work quietly with their new neighbours, etc., etc. ? The next three men (each told separately) to yoke harrows and work across the old " stubble-

furrow." The others—those with known good carting horses—to go to the railway station at Earlston ($7\frac{1}{2}$ miles) for 5 tons of bone-flour. The women and boys to get hoes, and take the forenoon hoeing some early cabbages (which the out-going tenant's men had planted for me), then to gather weeds, etc., after the harrows in the afternoon. The cattle and spade-hands go into the garden and grounds to clean up after all the furniture vans and carts, which had been out the day or two previously; but the cattleman, to begin with, has to feed the pigs and put the home and farm servants' cows out to grass in a field nearby. There these remained for the rest of the season, the milking being done three times daily and all outside in the open field.

In years, very much later, when examining students of the Agricultural College, I was now and then in the habit of asking them to detail the orders they would give to their farm-servants on the first working day of their entry to their farm, with not often a very satisfactory answer forthcoming.

After these orders had been given and the workers had all gone to fulfil them, the next thing was to go round the different fields and see that the orders had been understood and were being carried out; also that the horses—gathered from here, there, and everywhere—were working well in their new connections and the implements doing satisfactorily; later take another look at the "no' weel" horse, then in to a wash-up and breakfast.

As work was, at that time of year, a pressing matter on a large arable and stock farm—about 150 acres of ground being to prepare, ridge up, and sow in turnips ("made" is the local term for these

operations) in about three weeks—time was precious, and the full “strength” doing always full work was required, so it would not do to lose even an hour’s work. Therefore a letter had to be written to Archie Patullo, the horse-dealer, to send up at once a good working farm-horse for plough and cart. Two days later a man appeared with a grey gelding, rather weak-looking and not like much hard work. It was put into a cart, went for about 200 yards and would go no further. He was then put into a plough, and after staggering about for an hour or two was brought home. Next day the same process was gone through, but, instead of an empty cart, some clay was put into it by the Steward—I presume on the ground that it was beneath the dignity of a work-horse to be asked to pull nothing but an empty cart—with the result that the horse pulled the loaded cart all right. Later, he was again put in the plough with very unsatisfactory results. Again he was put into an empty cart, and would not pull a stroke; he would not even tighten a chain—though we burned a lot of straw below him he just jumped and threw himself down. As he was not hurt I sent him back to the dealer with a letter saying that he would not do. The only effect of this was to have him returned to me with a note saying just to keep him; that the man he had bought him from was honest and said he was a good horse and would work all right if only I had patience, and that he was not asking for payment—for a long time. I paid for “Charlie,” which was the name he eventually got, about eight months later, and he died at a good old age after having been, for about ten years, one of the best horses on the place.

CHAPTER VII

HISTORICAL, ANTIQUARIAN, AND OTHERWISE

BOON is said to be in the Barony of Corsbie, which is a detached portion of the Yester Estate. At one time it belonged to the Cranston family and later to the Maitland-Lauderdale Estate.

The name "Boon" is a corruption of "Bound." The water that flows round the north and west sides of Boon Hill is called the "Boondreich Water," and is an old boundary probably between the two districts of the Lammermoor and the Merse.

There is no jurisdictional or administrative difference between these two districts. The only point to note is that annually in February, when the Fiars Prices are "struck," there have to be two fiars for barley and oats—Merse barley and Lammermoor barley, Merse oats and Lammermoor oats. Also that Merse barley has generally, from the evidence led before the Fiars Court, been considerably higher than that of Lammermoor, while there is much less difference between the oats taking an average of years. In fact, the high-ground oats have occasionally been the better. This may have been caused by quite simple reasons, such as the later harvest having the better weather resulting in a better quality of grain; or, on the mixed farms of the higher ground, the custom of threshing the crop

when the straw was required for forage for stock, rather than to get the grain to sell; there might be an advance in prices in February above those of November and December. As there were more high-grown oats sold at that time the evidence put forward would show it, and the higher fiars would be with the higher district. I understand that it is the practice for those ministers concerned—whose grain stipends are fixed according to the fiars—to be paid on the higher scale of prices, whichever it may be, whether their parish is in Lammermoor or the Merse.

The last time that I was summoned to serve on the Fiars Court (about thirty-five years ago) I filled up my Schedule of Grain Sales in such a way that it could be read for either Lammermoor or the Merse. When called to give my evidence, the presiding Sheriff-substitute objected to this, and handed it back to be altered. For answer I asked him if my farm were in Lammermoor or the Merse. He replied that he did not know and appealed to his Sheriff-Clerk, who was born in Lauder, but he also said that he did not know. I pointed out that, from its name, Boon was the "Bound Farm," and that it might really be in the Merse, at which statement there arose in Court several objections against such a "high" farm being called a "Merse" one. After the Sheriff had considered the matter for some time he decided to put aside my Schedule, and dispense with my evidence. I therefore departed, and have not been asked to sit on a Fiars Court since!

As a registered medical practitioner I ought to have been exempt from service on any jury.

Unfortunately, in early days, as I was doing no medical work I had neglected to register, *i.e.*, to pay the registration fee of £5. During my second summer at the farm I had gone to the west of Scotland for a holiday, and while there a summons to attend a jury trial at Greenlaw—then the County town—was forwarded to me. I wrote to the Clerk—a personal friend who was very fond of a joke—that as I was far from home, and a doctor in practice, he must get me off. When he had replied that he would do so I did not think any more about the matter. Later, I heard that inquiry had been made, and as it had been found that I had not registered I was, legally, *not a medical practitioner*. As the Clerk put it when next I saw him: “You were away courting, you know! You’ll need to pay the fine,” which was so many “merks Scots,” equal to £5. I registered, however, at the same time and have never since been served with a jury summons. This exemption, however, did not keep me clear of the Fiars Court; it was the difficulty of knowing in what district my farm was, that did.

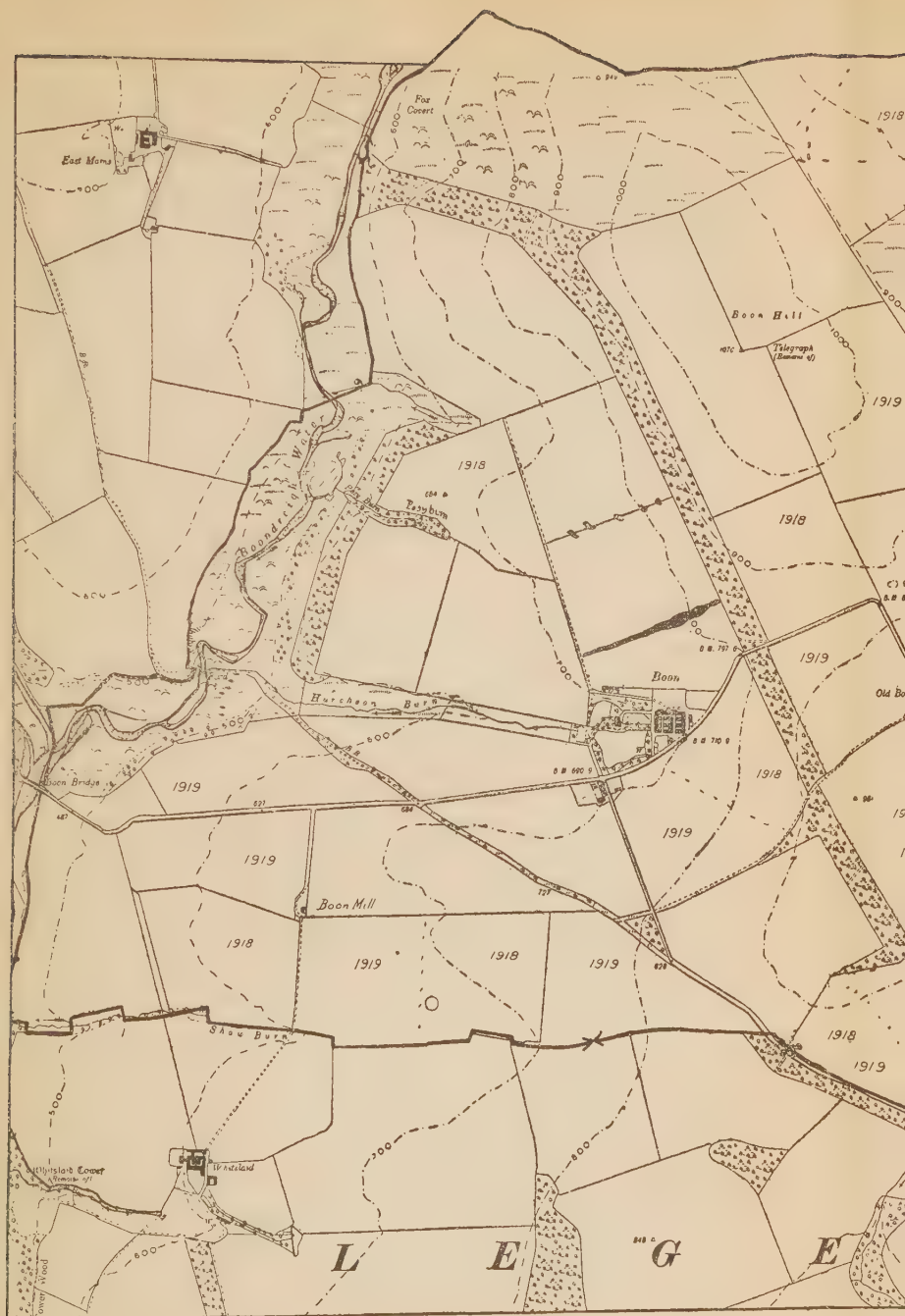
There may have been other reasons why the “Boundary Water” got the name of “Boondreigh,” and that it did not mean that it had once been the boundary between the Merse and Lammermoor. To the north, the geological formation is Silurian, the upper layers being carried off by denudation and deposited on Boon Hill—an enormous dump—and over the valley below. There is a distinct line of demarcation where the water flows, but at the time it got the name not much notice would be taken of geological formations among the local inhabitants, who are generally responsible for place-names. What-

ever its origin it is now called the "Boondreigh Water."

The Blythe Burn, the Brunta Burn, and the Pyetshaw Burn—all coming from the north and east, meet at the Dod Mill, where they form in one stream called the Boondreigh, which flows thence in a course of little more than $2\frac{1}{2}$ miles to its junction with the River Leader at Boon Bridge. Away up in the heart of the Lammermoor Hills on the upper reaches of the Bruntaburn, and in Longformacus Parish, there appears (according to the Ordnance Survey maps) the name "Boondreigh" Burn. This is an example of the Surveying Engineers' inaccuracy in accepting place-names from any odd shepherd or other persons they happen to meet in the course of their work, instead of going to responsible people for the required information. The Brunta Burn comes from the back of the hill known as the "Twinlaw Cairns," and there is no "Boundary Water" there. If "Boondreigh Water" does not mean "Boundary Water" then it is merely an absurd collection of letters, and had much better be shortened to "Boon Water," as it is generally called by other map-people who are not employed by the Government. Otherwise, if looked upon as a corruption of "Boundary" it is really a most descriptive name and conveys a most interesting story.

BOON HILL is 1070 feet above sea-level, and is a very prominent eminence standing out boldly to the south of the Lammermoor range, with the Boondreigh Water to the north of it in a valley about a quarter of a mile wide.

A young lady friend visited us in the summer of



1872, and being much interested in many of the things which she saw at Boon, took special note of the height of Boon Hill. On her return home she met a young civil engineer, who was bragging that she could hardly puzzle him with the height of any hill in Scotland over 1000 feet. She at once asked him the height of Boon Hill, thinking he would be easily beaten, but he immediately replied: "Ten-seventy! You could not have given me an easier one. All the hills in the west of Berwickshire and part of Roxburghshire are calculated from Boon Hill. '1070' as a unit makes calculations easy with a one, two nothings, and a seven." In any difficulty it was used as a corrective.

Actually "in the reign of Queen Anne," as people say, there was a large cottage on the top of Boon Hill which was inhabited by a sergeant and two soldiers. They were officials stationed there to attend to the semaphore beacon which was used to warn the whole valley, and the lower ground to the east and south—where the regular line of beacons could not be seen—of the approach of danger from England and the sea. On Boon Hill, the beacon stations—from the coast by Halidon Hill and Hume, or by Kylo Hills, Doddington, and the eastern Cheviots; or those from the west by the Maiden's Paps in Liddesdale, and the Eildons, or from Fife on the north by Lammerlaw—were all clearly seen. By about the middle of the nineteenth century only the gable of this cottage was left standing, and even it was a prominent landmark. Then, during a great hurricane one night, the old gable was blown down. The fact of its removal from the landscape, as viewed from her window next morning, was noted by Lady

John Scott at Spottiswoode, about three miles away. Although Her Ladyship doubtless knew the character of the Marquess of Tweeddale she wrote to him, asking permission to put up a small tower on Boon Hill to commemorate the site of the old fort. His reply was :—

“When I want to put up buildings at Boon I shall do it myself,” and straightway a messenger was sent post-haste to Boon to find a mason and to erect a tower at once “of a sufficient height to be well seen from the windows of Spottiswoode House.” This must have been about 1840, and the little pepper-box tower is still standing.

THE BLACK DYKE.—There is another name, with the sound of sinister intrigue hanging to it, on the moorlands, where a series of mounds are known as The Black Dyke, or Heriot's Dyke. It may have been a fort, or a fortified boundary wall at one time, but history has been forgotten, and the romance for us now is only in the name. This same Lady John Scott of Spottiswoode, with her lively interest in all old cairns and antiquities, used to view with apprehension my ploughing operations on Boon Moor. Many were the injunctions I received from her “to be careful of the old trees” . . . “the green bank” . . . or “the ancient mounds.” But even she, with all her old records, had no light to shed further around the meagre remains than that they were called “The Black Dyke.”

THE DOD'S CORSE STONE.—In its present state this is a stone with a square base measuring about 3 feet by 3 feet by $1\frac{1}{2}$ feet, and with a hole about one foot

square in the centre, into which part of what seems to have been an obelisk or cross was inserted. This cross has been broken and one part lost; the remaining part—which I fancy was the top of the cross or obelisk—has been cemented into the hole of the base block. This was, I think, done by someone for Lady John Scott without consulting the proprietor or myself. The stone lies in a wood near the northern fence of one of the new strips of plantation. It commemorates a duel which ended a quarrel between a man named French and a Cranston of Corsbie. For the death of Cranston French and Wight were tried and hung, as the following weird description from the *Pitcairn's Criminal Trials* indicates:—

“A.D. 1612—SLAUGHTER—13th March.

“Alexander Frenche, Tutour of Thorniedykis and James Wicht at Gordon Mylne, his Sister . . . sone . . .

“Dilaittit of airt and pairt of the slauchter of umqle Johnne Cranstoun, brother of Patrick Cranstoun of Corsbie, committed be thame, upon the grund and landis of Boun, in the Merse, upon the tent day of Februare, last by past, be wounding of him in the heid, leg, and dyverse otheris pairtis of his bodie, to the effusioun of his bluid in grit quantitie: off the quhilkis straikis and deidlie woundis the said umqle Johnne nevir thairaftir convalessit: bot upon the first day of Merch instant, depairtit this lyfe of the saidis hurtis and woundis.

“*Persewar.*—Patrick Cranstoun of Corsbie, as brother. The Persewar, be his grit aithe, declaris that he has most caus to persew: and sueris the said Dittaye to be of verritie, and takis instruments thairupon: and Protests for Wilfull Errour, gif the Assyse acquit. As also, for varificationoun thairof having uset and producet the Depsitiones of certane famous witnesses quhilk was oppinlie red in Judgement.”

“*Verdict.*—The Assye, all in ane voce, be the mouth of Hew Bell, in Blithe, Chancellor, fand, pronuncet and declairit the said James Wight (? Wicht) to be ffyley, culpable and convict of the

crewal and unmercifull slauchter of the said umqle Johnne Cranstoun, and Siclyk, for the Maistis pairtis Declairit the said Alexander Frenche to ffylet, etc.

“*Sentence*.—To be tane to the Castell-hill of Edinburgh, and thair, thair heaidis to be strukin from thair bodeis; and all thair moveable guidis to be escheit and inbrocht to his Maiesteis use as Convict, etc.”

Lady John Scott of Spottiswoode, referred to above, was Alicia Spottiswoode of Spottiswoode, and a somewhat extraordinary woman. Her husband, Lord John Scott, belonged to the Buccleuch family. She was an antiquarian of considerable note, a musician and composer, a poetess and authoress, a patriot—both local and national—a patrician and a Conservative. Perhaps she grew a little intolerant in her later years, but naturally, according to her own views, she was a “well-doer” always. Robust both in body and mind, it was her habit to spend part of her time at Thurso, on the wild sea of the Pentland Firth, where sea-bathing was a favourite pastime. The greater part of her year was spent at Spottiswoode House, about three miles from Boon Hill, which was itself more than 800 feet above sea-level. There, with her windows always open, she could look out on the parks and trees of her extensive grounds and policies.

Her friends visited her generally in summer, being unable to withstand the semi-arctic climate in which she delighted. One gentleman, it is reported, arrived to spend the New Year with her. Feeling chilly during the night he got up to shut some of the windows in the passage, but stepped out of his bedroom into a deep snow wreath collected on the floor! At breakfast he told her that he had forgotten

something he ought to have done, and would require to leave that day to see about it.

On Boon Moor there is an outcrop of Old Red Sandstone formation, in the form of a small ridge of red sand. This is now planted up, but is the site of an old "double" stell of which, notwithstanding the cultivation, the earthworks are still quite evident. There have been, at one time, quite a number of stells, but this is the only double one. In an adjoining field there is another outcrop of the Old Red, and here are to be seen the remains of the old quarries that were worked at one time. The stones, of which there are a few in the neighbouring dykes, are not very durable. A story is told of the last quarryman getting out in autumn some stones which he dressed and squared for future use. On coming back in spring, it is said he found little else than "heaps of red sand." Before the days of "Bloom" dips we used to use the red sand to colour sheep and lambs before sending them to the sales. It made them all of one natural colour.



Double Stell.

An incident, which is full of mystery and only indicated by the name, is the *Candlemaker's Loup*; the field is the "Candlemaker's field," and the road is the "Candlemaker's road."

The story, as told to me, was that at one time there was a group of candlemakers who lived at the side of the old wagon and pillion road between Coldstream and Edinburgh—in fact, the main road of these parts and times. The little hamlet occupied by these candlemakers—perhaps grandfather, father, and son, etc.—was on the most exposed part, on the very brow of the old Boon ridge, over 900 feet. It was,

perhaps, well that it was so, for the boiling down of dead sheep to get the tallow would at no time be very savoury, and it would be a distinct advantage to live where there was likely to be plenty of breeze to disperse the fetid air. At that time there would be bogs and wet places all around, and so, on Boon and the neighbouring farms, there were probably plenty of deaths among the sheep, and therefore a great quantity of the material required for the industry. The unsavouriness of their calling would not necessarily impair their health ; one, at anyrate, of the younger candlemakers seems to have been athletic enough, if there is any truth in the story that, at a competition, he made such an unprecedented jump that he fell and broke his neck ! A big stone is pointed out as marking the spot where it occurred. Be this as it may, there must have been some origin for the name given to the fields and the road ; whether the above story, or other stories, in the lives of these candlemakers is accountable for the names we cannot say. The road in itself is interesting. Where it is soft and marshy it widens out considerably, but where dry it is comparatively narrow. No road metal has ever been used, and, as was the custom, no regard was shown to the steepness of the ground. The road goes straight up and down, generally keeping to the high ground as much as possible.

Boon Farm-house

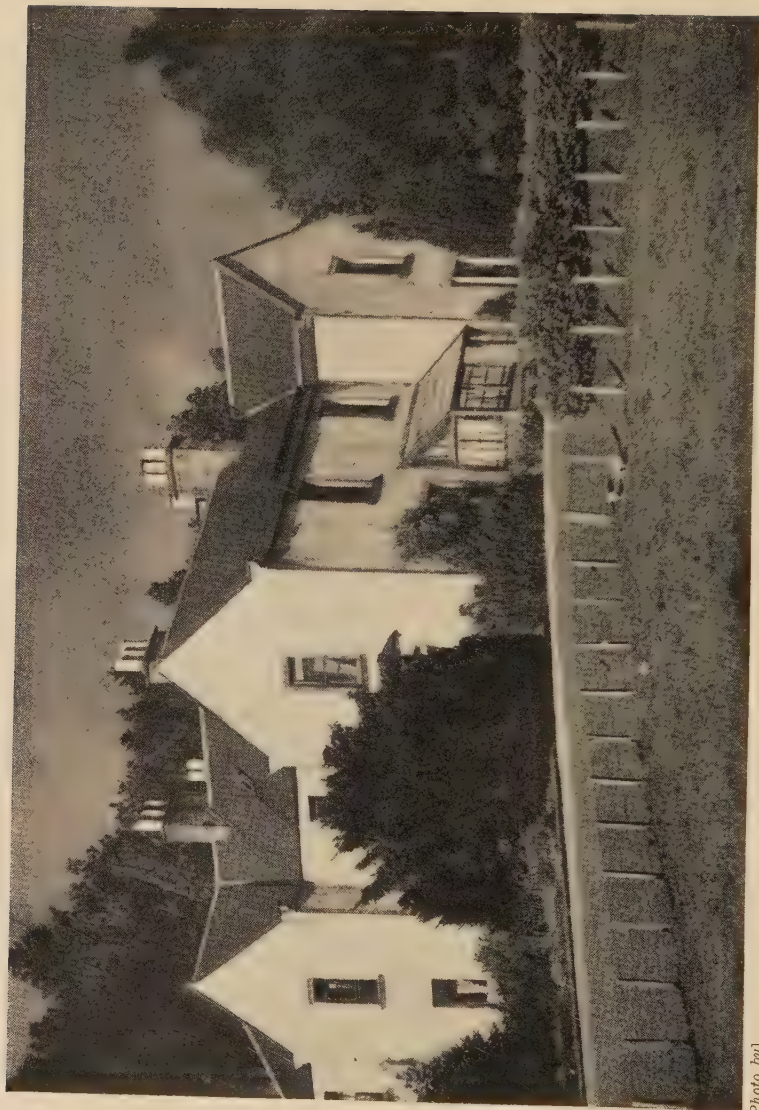


Photo by

CHAPTER VIII

BUILDINGS

THE dwelling-house at Boon, of the conventional villa type, was, in 1872, considered to be a good one, and more than one of the farm-houses on the Yester Estate were built on the same general plan. At my entry I found that dry-rot threatened the wood-work, and the first thing to be done was to put air inlets under the ground floors, and a five-foot trench filled to nearly the top with stones all round the walls.

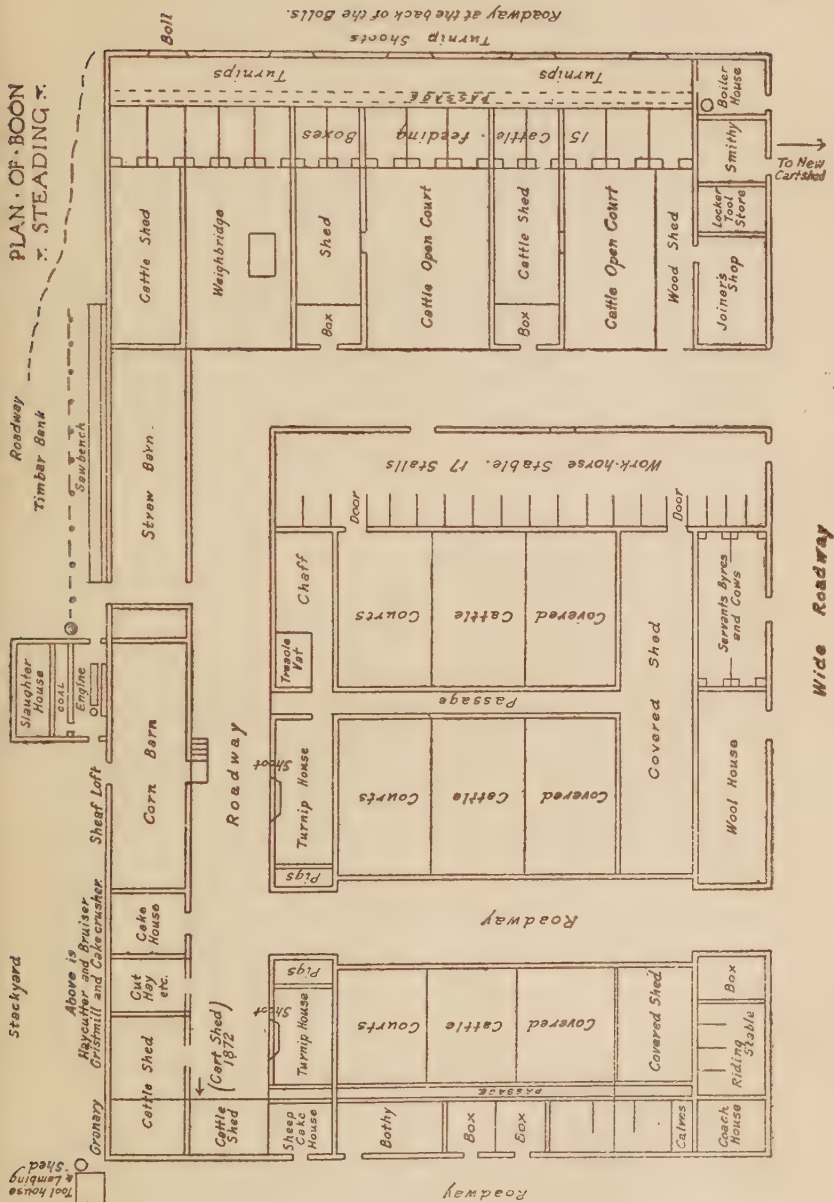
The entrance lobby of the house was narrow, but the two public rooms opening off it were fairly large and nicely proportioned; along the passage there was the business parlour on the left, a small room, and beyond this were the kitchen premises. These last were very inadequate, and as the back outer door opened to the east they were also very cold. The main staircase rose from the back of the front lobby and was very steep and narrow. (Report had it that the architect forgot to put a stair in his plan and that it was added, in a small corner, as an after-thought. I have heard the same tale more than once about other houses, so it probably had no foundation in truth.) As a means of access to five good bedrooms on the upper floor it was very poor and unsatisfactory, while it meant that all large articles

of furniture had to be taken in through the windows. The maids had a small stair from the kitchen to their own quarters.

On the expiry of the first lease of twenty-one years considerable alterations were made in the house. The chief improvements were a new servants' bedroom and main stair, a washhouse, a porch at the front door, and a milkhouse or dairy (there had been none previously—fancy a farmhouse without a milkhouse!!) for all of which I had to pay the larger share, about £200, the estimate being £350. The landlord, however, paid for the painting and papering which had not been included in the estimate. These and a few other details now transformed the house into a comfortable home, and as the trees and shrubs, many of which I planted, grew up it became one of the prettiest places in the Valley.

The steading is a large one, the site of it being immediately to the west of and partly on the steep slope rising up to Old Boon. The new house and buildings are just on the 700 feet contour line. The inequality of the ground had to be modified by a great deal of excavation and banking, in many places over six feet. Out of the subsoil, after the excavations, water spouted up every here and there and had to be drained away. These do not last for ever, springs shift their source, and the stones of which the drains are made get constantly silted up, so that there is never a season in which water does not come bubbling up somewhere and new drains have to be made.

The engine-house, corn barn, and straw barn lie in the middle of the north range, and a granary is constructed over what was intended to be a cartshed.



The last was quite useless for this purpose, being in an angle and the space in front very narrow (to yoke more than six carts at a time was impossible, and often twelve or fourteen were required). Besides, it was at the other side of the steading from the stable, and most inconvenient, so a new cartshed was built at a cost of £140, of which the landlord, according to custom, paid the half. It is the best part of the steading and was most useful in the many late and wet hay and grain harvests which I experienced. The work-horse stable was for nineteen horses all in a row. The dung had to be taken across the roadway to large, open courts. This was altered later by breaking out two doors to the west, so that it could be put straight into other courts without messing up the roadway.

The store cattle courts are to the west of the work-horse stable, and the feeding cattle courts to the east. There were ample turnip houses for all, and the big, open, wet and exposed courts, with the minimum of shedding and shelter, gave plenty of room to break down all the straw and make dung, of a kind, probably like the specially prepared "straw and water" which I have seen recommended recently. I think that it might do without the rotting and the water, and, from the result of an experiment which a neighbour and I made long ago, there is a certain value to the succeeding crop from carting the straw out and spreading it on the field just as it is. It may be that the soil is kept warmer, and the soil-bacteria enabled to begin work earlier in the spring than when the land is completely exposed to the winter frosts, etc. Chemically there cannot be much available nitrogen and potash in the exhausted

straw to benefit the immediately succeeding crop, anyhow in its early stages.

The feeding of the cattle in the courts was done in a somewhat novel way. A turnip shed with six openings, or "bolls," on to a roadway, and at 4 to 5 feet above the floor of the shed, sufficiently large to allow a cart of turnips to be "couped" into it, extended nearly the whole length of the east end of the steading. The portion reserved for the whole turnips was about 7 feet wide, and ran down parallel with the cattle-feeding troughs and a passage laid with Caithness flags. The turnips were kept from falling on to the passage by wooden boards set loosely into slots in the sides of posts from 5 to 7 feet high. They were thus easily got at, and were cut up on the paved passage, then they were shovelled up into the feeding-troughs alongside, without any wheeling or carrying. As the level of the turnips in the shed got lower, all that the cattleman had to do was to remove a board from the slots and put it aside until it was again required, that is, when the turnips in the shed were being renewed. It was quite an ingenious device, and there seems no reason why it should not have worked well, as it was left in good working order for me.

I had, however, made up my mind that the big, open courts were too cold for fattening cattle in large numbers, and for store cattle, that could be wintered mostly on straw and a little meal or cake without any great quantity of turnips. I never seemed to need so many cut turnips as to make use of the full space allowed in the way thus provided. Besides, as turnips were the most expensive crop to grow it became imperative, as times got worse, to have a greatly

reduced acreage of them, and as I had large numbers of half-bred sheep the turnips were all, or nearly all, consumed by them.

I used sometimes to wonder how far heat is supposed to be essential for fattening cattle. I think it is correct that excessive cold is detrimental, but have often felt that to bring in cattle to covered courts, parricks, or boxes in autumn, and to see them sweating with a lot of white turnips before them did not mean that they were putting on very much weight per day. My wonder increased, but I kept silent, when some wiseacre would exclaim: "Doctor, your cattle are doing fine . . . see how they are sweating!" Later, when I got the open courts covered in, I took care that there should be one end open; after the second year I thought that there was not enough sun getting in, and I had three large ridgelights fixed in each. Visitors used to think there was too much air—"draught" they called it—and that "such a lot of light was quite unnecessary."

The byres, riding-horse stable, and horse boxes, with coachhouse, etc., were on the south and east sides.

The greatest faults of the steading were the site and the excavations, its unnecessary size, and rambling nature. As originally built it was supposed to be a model for the County and the time; it can never, by any possible alterations, be that again! But the agricultural architect probably does not exist who could make a much better job of it. My opinion has for long been that farm buildings are made much too solid—farmers and styles of farming change but the buildings remain, unwanted by some, too small or too awkward for others, and frequently too difficult

to alter. Personally I think that only a limited number of stone walls are required.

Forty-seven years ago I bought a quantity of railway sleepers and some light homewood for rafters, etc., in order to put up a lambing shed. The sheet iron for the roof I got from Warrington. The shed was, over all, about 240 feet long by 9 feet wide. The sleepers cost £16, the homewood £8, the sheet iron £22, and probably £5 to the local joiner for putting it up with the help of some of the farm-servants. Thus, a total of little more than £50, besides the cost of tarring and cartages, gave me a fine shed enclosing about one-sixth of an acre, which held over 20 score of ewes comfortably at night, with about 50 ewe parricks, under cover. The cost of upkeep during twenty years was nil; after that £1 a year would easily cover all further outlay for renewals, upkeep, and repairs. The valuation by the arbiters at my waygoing for this shed and the adjoining sheep bughts was £30, say half for each!

It is true, of course, that at the present time the prices would be more than double what they were in 1875, but even so, the shed has served my time and my purpose, and a new tenant will have new ideas and will be able to erect a shed according to his new needs. On the other hand, for the sake of enforcing my argument for less solid building, take the alterations to the stone and woodwork of the main part of the steadying which cost £700, merely because it was so inconvenient and out-of-date, *not*, mark you, because it was *worn out*. *It will never wear out!*

I once succeeded to a cottage which was very much out of repair. It took £600 to make it

habitable, and it has now a £20 rental. Shortly after this experience I met a builder who was putting up a house for £750, complete in every way. It had two large rooms more than mine, and looked better. I asked how he did it. "In the first place I am putting up ten of these houses, so it is a standard house; and, secondly, there is no nonsense about it." I don't exactly know what he meant, but I can quite easily understand that it may very often be "nonsense" that costs us so much money now and then in our building operations.

When I was a Director of the Highland and Agricultural Society three of us were asked to judge a number of plans of steadings suitable for small holdings, to cost from £500 to £700 each. They were mostly too elaborate and could not have been built for the money using even the poorest materials, though a few could have been completed according to specification by using less durable materials than was the general rule. I pointed this out to my colleagues but was out-voted by the argument that the buildings must "last for at least two generations." The result of the affair is in the Society's "Transactions," so I need not add further details, but still, I often wonder if "this too, too solid" building is justified.

In spite of all my grumblings Boon as a farm is very well equipped, and in these hard times for landlords many farmers would be thankful to be so well housed. But it has not been done for nothing. For my predecessor the landlord expended £7000 and for me near upon £5000 on drains, bridge, buildings, etc. Add to this what we, as tenants, were bound to share, say £3000, and it will be found that £15,000 has been spent on "equipment" in less

than a century ; a sum which at any time during the last thirty years could have bought the place outright, except perhaps in the "boom" years during the War.

For a long period of years there was hardly such a thing as a sale of land in Lauderdale. Any estates in the lower part of the valley which did change hands were eagerly sought after by persons who wished to get into a favourite fox-hunting country, and so large prices were given. The estates of the Earl of Lauderdale covered about half of the whole area of the valley of the River Leader, from its source to its junction with the River Tweed at Leaderfoot, and about three-quarters of the arable land has been sold within the past few years mostly to the occupying tenants.

CHAPTER IX

CROPPING

BEGINNING to farm as I did, without any special practical training and comparatively little scientific knowledge of a kind likely to be of much real value, I was not hampered with any hard-and-fast rules and preconceived notions. One fixed idea that I had was to break up and improve the rough hill and moor land generally, and because I had expressed my intention of doing so I was selected as tenant of Boon—at least, so the factor said. I have, however, reason to think that my offer was one of the highest, and this, perhaps, would make the selection easier!

The Lease stated that the General System in vogue in the district was to be taken as a guide if ever any matter connected with the “rules of good husbandry” came to be considered. It also indicated that the five-course rotation, generally recognised as the soundest one, should be chosen; and that no rotation should be adopted which meant more than two white crops or less than two-years’ grass, in five years. There was a verbal understanding that if for any reason a field had to be ploughed up which had been in grass for one year only, then some other arable field or fields of similar area should be at the time in three or more years’ grass. With, at this period, falling grain markets, there was certainly

no inducement to crop more closely even though most of the arable land on Boon could be counted on to grow a paying grain crop for, on an average, four years out of every five. It should be borne in mind that in the first lease there was a big rent to be met, notwithstanding the reductions of rent which were allowed later, besides a large sum required as interest on capital expended. Grain growing on a certain limited area was to all appearance as likely a way and as simple a means to that end as any other.

In farming it takes at least three years to change the system. Many leases, as mine did, required that the arable land should be left at the termination in the five-course rotation, and to fulfil that condition—if a less intensive system of farming has been followed—it means beginning the preparations for leaving three years before the termination of the lease.

The five-course rotation is : one-fifth in oats after lea, one-fifth fallow or turnips, one-fifth oats or barley after fallow, one-fifth first-year's grass, and one-fifth second-year's grass or older.

First-year's grass is of much more value as a rule than older grasses are, whether for hay or pasture. On this account the full fifth in first-year's grass may be demanded at waygoing, and one is not very safe if less crop generally has been taken than the five-course rotation allows, unless such preparation as I have mentioned has been made for leaving the farm.

During the currency of a lease it is improbable that a tenant would be made to crop on the five-course rotation if he preferred to leave his fields longer in grass than that practice allows, and, except in unusual circumstances, there would not be much difficulty

with a factor who knows his business. There was, therefore, no trouble for many years as to the cropping question at Boon, and it was only when we had to crop to the maximum for a year or two during the War and after that any difficulty arose.

Generally, in mixed farming, the system of cropping depends on the kind and numbers of the stock kept. Thus, there would not be much cropping at all were it not that turnips, straw, and hay are required for the sheep and cattle in winter, and that for ewes and lambs young grass is needed in spring and summer. In 1873 (the first year when there was a full, regular stock on the farm) there were not many cattle, but the sheep were in full numbers. Some of these were half-bred ewes with three-quarter bred lambs, on the arable land ; a few Cheviot ewes and half-bred lambs higher up ; and Blackface ewes with cross Leicester lambs on the moorland. This entailed having a great quantity of turnips as the half-bred ewes were wintered on these alone for about four months, and the Cheviot ewes for two or three months. In those days there was not the large consumption of bought-in feeding stuffs which came to be the recognised thing some years later, and only a limited amount of hay was used for sheep, except during a snowstorm. Generally, it may be said that the whole working detail of the farm was subservient to the demands of the shepherd and the needs of the sheep.

The valley of the River Leader may be considered as part of one of the best mutton-producing areas in the world. Some places may keep greater numbers of sheep per acre, others may grow larger animals, while still others may show better quality of mutton

or of wool. But, taking them as a whole, and having regard to size, quality, and numbers altogether, the south-east of Scotland and the Border counties (Roxburgh, Berwickshire, and Northumberland) were, and are, for a sheep country specially good.

Taking into account the natural advantages and comparatively dry climate, the styles of farming over these and adjoining areas, in which sheep largely predominate, it would almost seem that they are being used to the best purpose. I have read, recently, a very valuable book by an Englishman¹ on the problem of Britain growing her own food supplies and saving the millions she pays for imported human foods of various kinds, in which the great sheep industry of the country is referred to thus :—

“From the national point of view sheep ought not to be looked upon as a very valuable asset; that is to say, while they have their uses they should be looked upon as only of about 1 per cent. or 2 per cent. in value in relation to the whole production or output of the nation's food. Were it not for their luxury value because of the flavour of mutton, and for their wool-growing, they are relatively very uneconomical. They have the advantage that they gather their food on steep hills, downs, and sides of mountains and heaths where only small quantities of food are grown to the acre, and where only long four-footed animals of a moderate weight can graze with comfort. . . . Again, a ewe has only one lambing a year, and in this respect is most uneconomical as compared with a sow, which may bring up 30 or 40 pigs before she is the age of a two-year-old ewe.”

After this one becomes rather diffident in affirming that it is well that the sheep stock is the predominant one in the south-east Border country, however suitable it may be. There is no doubt, from the point of view of the dairy farmer and his wife—slaving away at

¹ *Food*, by Sir Charles Fielding.

all hours with their cows and their milk ; or, of the arable farmer who has clay land, with his difficulty in overcoming the extremes of dry and wet in average weather—that the sheep farmer has, as a rule, an ideal life. But looked at generally, the comparatively lonely time in the sparsely populated country has to be discounted, the storm risks cannot be ignored, and the usually smaller returns may sometimes, but will not always, balance the smaller cost of living. For instance, the expense of education of the sheep farmer's family, which might entail their living away from home, would counterbalance many advantages. As time has passed an ever-increasing number of hill farms now have lost their resident-tenants and are recognised as "Led Farms" (*i.e.* farmed along with another farm or farms). Thus it would seem that the disadvantages have come to be recognised as being greater than the advantages. From the landlord's point of view, the upkeep of the farmer's residence—where there was a fairly big area of sheep ground but a small rental—was very often the deciding point as to whether or not there was to be a residential tenant. It is generally easier to house a shepherd than a farmer. When, however, some arable land accompanies the hill sheep ground there is usually a resident tenant.

TURNIPS.—At Boon, the plan to begin with was to have 160 acres or thereby in turnips. That meant about thirty-five score of half-bred ewes consuming, say, 60 acres between December and the middle of May ; twelve score Cheviot ewes would need 15 acres ; twenty-five score of hoggets—all wintering, and for sale as fat dinmonts the following autumn—perhaps another 50 acres ; and the cows and cattle would get

the rest. Blackface ewes did not get turnips. That would mean 300 acres of grain crop, and to produce this the best low-lying land was cropped on the five-course rotation. The "secondary," called so only owing to its elevation, for the best 50 acres of land on the farm were around Old Boon, at 930 feet, was cropped on a six-course rotation, *i.e.* three-years' pasture. The remainder was ploughed as it suited or when the pasture began to fail.

One of the drawbacks to a five-course rotation is the tendency in turnips to "Finger-and-toe," on land which is liable to the disease. Boon, even though heavily limed, had that tendency. The boulder-clay subsoil may have a good deal to do with it, but, be that as it may, I am certain that a great deal of the evil is caused by infection. The side-rigs of a field are usually the worst affected, and they are often sown with "White" or "Fosterton" turnips, which are the most liable to be attacked. They are duly carted off and laid down on a neighbouring grass and pasture field, and, when its turn comes two or three years later to have a turnip crop, its "inoculation" with finger-and-toe is evident. The season, the land, the seed, etc., all get the blame, anything but the simple, preventable cause to which it is probably due. Finger-and-toe is not to be trifled with, especially on a half-bred ewe farm where so much depends on the winter meat, and I made a fairly detailed study of it in its two common varieties.

I was managing for the widow of a neighbour farmer who had just died, in the last year of her lease. She was leaving the farm at the following Whitsunday, and it was advertised in November to be let, with

entry on 28th May following. There were 8 acres of a turnip field which had gone very badly with finger-and-toe. I thought it was rather hard luck for the proprietor, and also told against the credit of my deceased neighbour as a farmer that the public should see this field, so I put fattening sheep on it with artificial feeding in boxes, and had most of the turnips eaten before the first of the general offerers turned up. The successful offerer was a personal friend of my own, and knew the circumstances of this field. He had got the usual warning from the ever-interested public who said, when congratulating him on getting the farm: "They say you'll have it all to lime for finger-and-toe"; to which he replied, "So I am told!" As a matter of fact he limed one field moderately, once—not the 8-acre field in question. It he allowed to lie for three years in grass, took potatoes off it, and the next crop of turnips after that was swedes. I have watched that field ever since and there has never been any finger-and-toe on it again—and it is about thirty years since I managed for the widow.

When I entered, unfortunately I listened too much to the "wise public," who said: "You will have Boon *all* to lime." To a great extent I took their advice at considerable expense to myself personally, and for many years to the detriment of the land treated. Of course the lime killed where it came in contact with the finger-and-toe fungus, but it destroyed much else besides. It is a comfort to me in my old age to find so few people putting on lime by the big shovelful! I would say that 10 cwt. only per acre is enough at a time on any soil, or at the very most never more than a ton of quicklime except in newly

broken up land full of humus. After a long and costly experience my advice is: "If you have too much money give your land some more *food*, but not the excess of lime which will merely waste it."

An acid soil favours finger-and-toe and is not favourable to the growth of those bacteria which are now considered beneficial by agricultural scientists, but it does not take much lime to neutralise the acidity of some arable lands, and having neutralised it should be stopped. This is not the place to discuss the chemistry of the commoner points of agriculture in its many phases, but as some of our teachers may not have been farming themselves that fact should be borne in mind by them when they give their advice.

It is very difficult to know what to say to the small farmer who has, and can have, only one system. Whatever it may be—wintering dairy cows, fattening cattle, or keeping half-bred or other low-ground sheep in winter—he comes for advice about finger-and-toe. You cannot tell him to rest his land for two or three years, to grow potatoes or mangels instead of turnips, to grow swedes more, some of the disease-resisting varieties, or even to change his rotation—these things are mostly impossible for him. The cure for his trouble is lime, but he should be warned to use only a small quantity at a time and that in the drier seasons. The lime and the nitrogen in his land combine easily, and the compound is nitrate of lime which is very easily washed away.

Many methods might easily be adopted to prevent the disease on a large farm like Boon. The evident and the easiest one for me to adopt was to rest the field, and there are now few fields there that have

not at one time or another been down in grass for periods of from five to twenty years at a time.

In later years the turnip crop at Boon was curtailed by about 60 per cent. Instead of 160 acres, 90 were found to be enough; and with the lesser quantity the tendency was that the ground was better worked, manure was not grudged so much, and more attention was paid to the crop. The result was that instead of about 18 tons to the acre we got an average crop up to about 23 tons. The cattle got fewer turnips but more cake and meals; a third more Cheviot ewes could, as a rule, be kept wintered and grazed than half-breds on the same amount of land. At one time there is no doubt that we were, like practically all our neighbours, very lavish with turnips. Still, when most of the rent, etc., has to be paid out of the sales of lambs and wool, the mothers of those lambs have to be well fed, and plenty of turnips is the easiest way.

Farmers seldom or never count the cost of their crops, field by field. Few consider that besides the actual cost of say rent and the turnip seed there has to be added the cost which all the work connected with the growing and the eating of them entails on the staff. They do not consider that it all has to be deducted from the lamb returns, or from the succeeding grain crop. I think my reduced area under turnips was an advantage in every way, and though later it meant a smaller area under grain crops it required fewer ploughmen. Also, it was done at a time when oat prices were poor and labour was becoming more difficult to get. The manure tonnage was not reduced in anything like the same proportion as the acreage, and a good deal of extra

labour was expended on the better cultivation of the land. The general expenditure on the other hand became less, or rather it did not increase as much as it might otherwise have done.

At one time I had, like other people, a good deal of faith in a three-horse grubber. This was a big, strong implement with five large teeth. The three horses pulled it very slowly through the fallow ground which had not been touched in any way since it was ploughed after harvest. It was and is to this day the recognised implement for working most of the ground intended to be sown with turnips.

But one year, early in June, I was visiting a good old friend who farmed a very heavy clay land farm in Northumberland. He told me that he had still some turnips to sow, that he had ploughed the field three times and was to plough it again immediately before drilling up. I saw the "Oliver Chilled Steel" plough which he used, turning down the little dry knots—which most people would drill up, and sow, and expect to braird—making a fine mould which had got enough moisture below to make it friable and to braird the seed. "It was," he said, "the result of patience." The result was splendid. I saw the crop being lifted and weighed in the early winter—over 27 tons an acre of Fosterton Hybrid turnips—part being an experimental plot. When I got home I determined to sell the three-horse grubbers which I then had to the old-iron man the next time he came round, and there and then ordered five "Oliver Chilled" ploughs in their place. For the last twenty-five years I have had no grubber at work on the farm, except a light "Martin's Cultivator" when it was required after ploughing.

Although I have not cropped the worst of the clay land fields at Boon for many years I have often ploughed the fallow twice or more times before drilling and sowing, and have always noted that the more cultivation the more aeration; and the better the soil is aerated the better is the crop; and, further, that the big crop is generally the *clean* one. I know quite well that I seldom had a very good crop until I sold the grubbers, and afterwards very seldom had a bad one.

During the "Nitrate of Soda" years, when the Company which prepared it gave a £10 prize to the Lauderdale Agricultural Society for the best crop of turnips, I won it three years in succession. Then the District Committee evidently thought that I had too much of a monopoly, and divided it into three prizes of £5, £3, and £2. I thought at the time that it was an unfair thing to do, and I never competed again. The competition was given up later when a crop of only about 18 tons got the first prize.

My method of turnip-making was as follows:—

The surface soil which had been exposed to the winter weather was ploughed down; the deeper soil, to about 10 inches deep on an average, was brought to the top, dried, and worked to make it fine and clean. This cleaned and fine surface being aerated in the process, was in turn ploughed down immediately in front of the drilling ploughs and turnip seedbarrow. What was now the bottom soil, which had been ploughed down by the first ploughing, had by this time drawn a little moisture from below, and was just damp enough to braird the seed. The whole 10 inches of soil thus thoroughly worked, mixed,

aerated, and manured was in the best condition to grow good turnips. The weather, the freeness, looseness of the land and its cleanness, sometimes made the second ploughing unnecessary. I am sure that to make land, for turnips, up off the grubber was not a good plan at Boon on the boulder clay subsoil at any rate. I am giving my own experience, and I have tried to give the reasons. I am aware that there are many people who think that to save time and work and to get the turnips sown as quickly as possible, is the best and most profitable way. I have, in recent years, always been an advocate for the Chill plough, and the closer, deeper cultivation, with the proper aeration and stirring up of the deeper soil.

For the last thirty years of my tenancy I did not give the cattle very many turnips in winter, so at least 85 per cent. of the turnip crop was eaten on the ground by sheep. When the weather was wet and the ground too soft—which happened on Boon as on most farms in the valley—the ewes were put on to a grass field and got the turnips carted to them. If there were the least sign of disease in the turnips they were put on to permanent pasture which was not likely to be cropped. However, the turnips being practically all consumed on the ground, it allowed the arable land to be more easily kept in good condition. It was sometimes a good plan to sow down a portion of the land after turnips without a grain crop but with four pounds of rape, never, however, on a field which showed symptoms of finger-and-toe. I have seen it recommended in agricultural journals to sow up to 10 lb. of rape, but I would suggest—if it be advisable to sow rape at all—4 or 5 lb. as ample; sown in June, or even

later, is early enough. I have had a fine October crop sown early in August. Cultivate and manure the land well, and let the crop cover the ground a foot high before eating it, and it will pay best. As a makeshift crop rape does not pay, but for fattening old ewes either alone or with a little Bombay cotton cake, or some other fairly good albuminoid food, there is nothing like a good crop of rape. It is not usually the best food for lambs but sometimes it does them well if the weather is dry; and lambs that have been going on rape take to turnips very readily, which is an advantage.

BARLEY AND OATS.—As the acreage under barley depended on the suitability of the fields for cropping after turnips, it varied, and oats formed the principal crop. I have often heard Boon land described as “turnip and barley land.” This meant merely a description of the land, not that it was specially good for barley. We were also very dependent on the season and weather, and to get good barley had to sow early.

During the first fifteen years I found it difficult to grow good crops of any kind of barley on account of the land, but “Chevalier” seed did as well as any. Later on, other kinds came into use, and towards the end of my time I used a variety of “Plumage” barley which seemed to do best of all. I paid more attention, however, to oats.

I remember going to a place near Milnathort to see a crop of oats, estimated at 13 to 14 quarters per acre, and as these and others were very good, I tried some of the new kinds recommended. One of the first was a variety called “Newmarket”; others were “Waverley,” “Storm King,” “Abundance,”

"Tartar King," "Record," "Yielder," and "Golden Rain," etc., etc.

"Golden Rain" was a Swedish oat, yellow in colour, of very fine quality and with the straw good for fodder; most of the others had a very coarse, strong straw. At this time I had a young Swedish gentleman with me as a farm student, and I asked him to write to one of his friends—probably his father—to send me some bags of "Golden Rain" oats for seed. Never was an order more faithfully executed than that one; the quantity I had asked for was shipped direct from Gothenburg. It was the most perfect seed I ever saw and was of the finest quality, just as if every pickle had been specially selected. It was sown very carefully, and all through its growth I was very particular about it. It produced a crop of over 8 quarters per acre, making equally fine seed for another year. In the following years I sowed a large area of it and reaped a fine crop, selling quantities of it as seed to neighbours and friends. All over the district and further afield the "Golden Rain" oat is now a great favourite with the farmer though not with his buyer.

To the uninitiated these oats look, on account of their yellow colour, as if they were "weathered," but with me they have always given the best quality both of straw and grain, and have stood up against bad weather better than most other varieties which I have tried. Once I sent a quantity of this grain to a miller who had refused to buy them because he thought they would make *yellow* meal, although I had pointed out that the kernel was as white as that of any oat he ever saw. I asked him to make them into meal and report to me. When they

produced beautifully white meal, above his average quantity, all he could find to say was that "the meal had not much taste." This, however, was simply because they were of such fine quality that they required only a short time in the kiln, and were not as much roasted as the sample against which he tested them! I believe that the arbiters at my waygoing gave me the highest number of bushels per acre for my "Golden Rain" field.

Of other varieties of oats which I had at the end of my time at Boon one was "Crown," a heavy cropper but too late for a late year like 1922. The "Crown" was sown as a lea oat crop, after a fine crop of Wild White clover. There were over 60 acres of it, and although I expected it would have stood up, it was not nearly ripe by the middle of October, while three-quarters of it looked as if a roller had been put over the field. On the other hand the 1921 crop of it was of splendid quality and, when cut in August, produced over 7 quarters per acre, for which I got 32s. per quarter. I expected that I might get about the same in 1922, but the season was against me. Perhaps if I had put it all into "Golden Rain" or "Yielder" I might have succeeded better, but it is doubtful. I had a bad season for my last crops similar to my first, fifty years before.

The other kinds included "Hamilton" and "Sandy" oats; these were grown for the fine quality of their straw as fodder. The latter I grew on the most exposed, stormy hillsides where they did well, and in spring I sold seed to Caithness and Orkney. You can sleep through the roughest gale at harvest time if you have a crop of "Sandy," for it takes a regular hurricane to shake them.

HAY.—As my farming experience grew I came to understand how very important the hay crop was, and how very difficult to acquire. It was wholly for use on the farm, and I needed 60 tons every year. I generally tried to get about 20 tons of first-year's grass cut, but as the sheep were grazing it till well on in May, 30 tons was the average crop from that source. Second- and third-year's grass, with more or less of wild white clover in it, was not satisfactory, and I did not cut them often. Hay cannot be made from Wild White clover however fine a pasture it may be.

To make up my deficit in hay, therefore, I had recourse to Tare hay. It required very careful making, but was well worth it. It had about 20 per cent. albuminoids, and only needed oil to be equal to much of the linseed cakes on the market. I produced Tare hay in more or less quantity every year afterwards, and in only one instance was it spoiled by bad weather. The tares and oats, with the former bulking larger, were cut when most of the plants were in flower and before the pods were formed. Pods are very difficult to "win," and are not of much value in the composition of the crop.

The main object is to get the crop into small colls or ricks, with as little handling as possible and as early as possible after the first week, but I found that even in wet weather they will lie quite well for a week or even more in the swathe. In fact, before the end of the first week they should not be touched in any but exceptionally dry weather, and then with very little handling. If they are turned *once* on the first good day after the first week, they should be ready

CHAPTER X

LAND AND IMPROVEMENTS

FOR a good many years prior to 1872, and in Scotland at least for a year or two after, there was a very pronounced "boom" in Agriculture in its widest sense. Prices had been rising gradually, those for both Stock and Crop having had, as was evident, a very considerable run, and there was a consequent rise in the rent of farms whose land showed a prospect of a good return for its improvement. Naturally, those farms which were in themselves fairly dry were in most demand. Thus, some farms on Gala Water and the River Tweed, where part of the land though high did not need much draining, were tackled first and a great deal of ground was put under crop. The heavier and wetter land in Lauderdale was a little later in being handled because draining, a heavy item at any time, had in many cases to be done before any cultivation could take place. The practice at that time was to give the new broken-up land, and often also the old cropped land, a full dressing of lime, especially at the beginning of the lease, 4 to 5 tons per acre being quite a usual proportion.

In my first lease (1872) I was bound to break up and cultivate a certain amount of unenclosed and natural pasture, for the management of which certain

rules were prescribed. One of these states that "lime shall be applied at the rate of not less than five tons per Imperial acre." In many districts the result of this heavy liming was evident, and may be so still, where the lighter, drier, new broken-up land was heavily cropped for a rotation or two. The original humus being destroyed, partly by the cropping but mostly by the excess of lime applied, there was little growth in the fields, so that although fair incomes had doubtless been made early in a number of cases, the first flush of crops was difficult to keep up and much of the land became so poor that the last state was worse than the first. It was not until after quite a period of years when the lime salts had been washed out of the soil that the natural grasses (often little else than moorbent (*Agrostis*)) began to gather in to the pastures, and in that way showed symptoms of accumulating a fresh supply of humus. Often, when he thought of the matter, the farmer might have probably come to the conclusion that moorbent and the hard fescues, etc., were poor grasses for sheep, and might consider that he could improve matters by ploughing and sowing down again. Let us suppose he did so and took a poor crop of oats, which he would most certainly get; then he took a crop of turnips, which maybe paid for his manure and the special labour required; these were eaten on the ground by ewes carrying lambs; thus phosphates would be taken out of the soil and there would be returned to it little else than nitrogen, which, in its turn, would be mostly washed out in the succeeding months. The soil being light would get the benefit of the treading, and a certain amount of chemical action would result which might help the

succeeding white crop and the young grass with it. But the whole process would not have paid him, and by the time the field is in second-year's grass it is worse than ever. Whereas, by leaving it alone for a few years longer it was, though paying little, not costing much, and at the same time the humus was again being formed which would eventually give something to work on for the future.

At Boon the soil is of a somewhat different kind—in fact it is of many kinds, though mostly a boulder clay soil overlying the Old Red Sandstone. The denudation of that part of the Lammermoors which lies to the north had resulted in the deposit of huge masses of detritus which we now call “boulder clay.” Boon Hill (1070 feet above sea-level) is just a solid heap of this boulder clay from which some of the finer particles have been washed away. What is left on the top and the sloping sides of the hill is more gravelly on the surface though with a much stiffer and stronger subsoil. On the arable part of the farm the soil is, from an agricultural point of view, mostly a free, gravelly loam, except in the hollows and flats where it is a fairly heavy clay. It is of a warm, reddish colour, most of it is fairly easily worked and is not infertile.

There was a period when it was clearly understood that Coal Measures lay below the Red Sandstone, and George, Marquess of Tweeddale, knew this well. Conceiving the idea that there might be coal below Boon Hill he engaged a party to bore. This was, however, before the day of Hugh Miller who, pointing out the difference between the Old and New Red Sandstones, showed that the one (the Old Red) was below the coal formations, and the other (the New)

was above them, but that the Lauderdale and many other sandstones belong to the older formation. His Lordship at once understood that there was no chance of coal at Boon and forthwith stopped the boring operations. The tools used for this boring were preserved for a long time at Yester.

The moorland at Boon lies below Boon Hill and to the east of it. It is about 800 to 900 feet and very much the same as much of the moorland on the lower parts of the Lammermoors. As, however, it is pretty flat and is on a hard, firm, tilly subsoil, it is very wet. It had a good "flow-bog" (cotton grass (*Eriophorum augustifolium*)) which is still there and is a valuable adjunct to the heather ground, the latter being good and growing readily after burning. Originally there were about 600 acres of this unenclosed moorland and rough ground, about 450 acres of which would at that time be probably heather, and with rather too much "bell" heather in some parts. For the greater part it was, as I have said, fairly flat, though undulating in a small way with numerous shallow hollows running north or east and forming a sort of natural drainage system. The remaining 150 acres were rough, coarse pasture with natural dry patches here and there which bore a kindly herbage. At my entry in 1872 it was, as a whole, rather a good moor as moors go, though very wet. On account of its comparatively flat, exposed position it was subject to very wild snowstorms at times. It gave good grazing for from 12 to 15 scores of Blackface ewes with Leicester cross lambs, allowing about $2\frac{1}{4}$ acres to each ewe. About the middle of August you could have, say, 12 score of fat Greyface lambs and the mothers would be kept

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with the minimum of extra feeding during an average winter.

Boon Hill had about 200 acres more or less and was a very different subject. Naturally very dry and gravelly, except to the east, and very steep, especially to the north and west, it grew a short, weak herbage of sheep's fescue and moorbent and was very late and of little value till June. It did not "do" a hogget to the acre and was therefore of no use at all for cattle till well on in the season. If about a dozen stirks were put on they would get plenty of exercise, fine fresh air, a beautiful view, a little food on the wetter clay part to the east side, and they would turn older but seldom either bigger or fatter! When ploughed it was very stony, mostly quite small stones, the few bigger ones there being just enough to build a five-foot stone dyke which I put up along the highest part of the ridge for a distance of about 400 yards. This formed an excellent shelter for stock on such a very exposed and stormy hill, and was built in 1880. There were no stones big enough for "bonds" so these had to be of wood, and they were still efficient though rotting a little on the exposed ends when I left in 1922. The soil on Boon Hill is a nice fresh, reddish colour.

In my experience oats will ripen even up to the highest part on the east and south in almost any year; but on the west I have had to cut oats on two occasions pretty green in the end of October. My attention having thus been drawn to this matter, I have noticed that in a great proportion of cases the greener oats at harvest time lie to the west, where they get the afternoon and evening sun instead of that of the morning. I have been so impressed with

this fact that for twenty-five years I did not crop the west side of Boon Hill, whereas fields on the east side have been cropped three or four times. The mere fact of a field being greener on its west side proves nothing in itself—it may be due to a variety of causes such as deeper soil, wetter subsoil, etc.—but when one is cropping high land, and in variable seasons, the question as to whether the crop will ripen becomes an important one. Generally, I could depend on the crop on Boon Hill ripening, but that on the moorland would do so only in very exceptional seasons although it was from 150 to 200 feet lower. No grain crop has been taken off any part of the improved moorland for the last thirty years, and very little before that.

The area on Boon covered by buildings, roads, woods (planted strips), gravel banks, waste and unavailable parts was about 135 acres; in the haughs, burn sides, and paddocks 80 acres; and the balance, except for the heather and moorland portions, can be called arable land. The Boondreigh Water haughs and banks extended to about 60 acres, but as they were very gravelly and water-run a considerable reduction had to be made for “unavailable ground.” I understand that these haughs (60 acres) were valued by my “Authority” in 1872 at over £100, and in 1874 he actually offered me £100 for the grazing of them for the season. I consider that that offer was made only to show that he could hold to his own original opinion, and that really he had no use for them. No more was therefore said about the matter. Had I continued to value this area at anything approaching that sum my income would have been smaller, for I do not think that I ever

made £50 of rent out of it in any one year that I farmed it.

A great deal of the arable land was wet, roughly perhaps about a third of it. The wetness was to be found over all the fields—10 acres in this one, 5 in that, 20 in the next, and so on. Stones or branches of trees had been used in all the draining that had previously been done, and a proportion of the wet parts were due to these stones and branches becoming choked up; but in many parts no attempts at all at draining or drying the ground had ever been made. My predecessor had sown his waygoing crop—I think there were about 100 acres of barley and the rest oats—on about 400 acres of this class of land, and in ten different fields. The average height of the arable land on the farm was about 750 feet, and that of the waygoing crop would be at about 800 feet.

A very shrewd farmer gave his opinion, as a witness before a Royal Commission not so many years ago, that 500 feet was the highest limit for successful cropping, and in exceptional cases 600 feet. He farmed neither in Lauderdale nor in the west district of Berwickshire, in which, though it includes a Tweedside parish, the average of arable land is *over* 600 feet. But it must be recognised that the higher the cultivation is carried the crop becomes more and more dependent on the weather. In a fine, comparatively dry, sunny season some of the best crops may be the high ones, whereas in a wet, cold season they will probably be very poor and unremunerative.

Most of the fields at Boon are large, averaging 35 acres in extent but varying individually from 20 to

70 or 80. Although there are plenty of small stones on them, large ones are scarce. There were, therefore, few stone dykes in 1872, the fences were very poor, thin hedges filled up with wooden fencing, and whin-dykes. The last were great earthen mounds which had been thrown up and sown at one time with whins; these had died out through neglect and the many gaps were filled up with paling and stobs.

Whins naturally make a good fence when they grow equally and do not get frosted, but they require to be fed with phosphates and lime like other leguminosæ. They are very apt to get thin below, so that, as the young plants are tender and slow growers, even with careful nursing the whin fence is a somewhat precarious one. When they had been useful on Boon as "fences" I cannot say, but in 1872 there were signs of about eight miles of them on the moorland side of the farm. In my time very few of the whin-dykes were of any use as fences; those that served that purpose were only partially made up with paling and stobs. They had a ditch at each side at least a couple of feet deep. On the top of the bank there was an odd whin-bush here and there. These whin-dykes must have been a great deal of trouble to make, but labour would be cheaper then, and they may have been temporarily efficient.

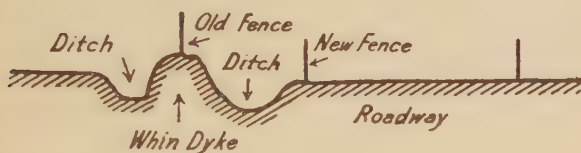
Whins can stand only a certain amount of frost and that only for a limited time. On the low ground, such as the Boondreich Haugh, at about 500 feet, whins have been in various winters entirely cut down by frost, and lived only by springing again from the root. But it is only on the most gravelly parts, where the roots have gone very deep, that there are any whins growing now. Higher up on Boon Hill,

and on ground above 900 feet or so—where the frost is four or five degrees less keen than lower down—they survive much better. On “Thunderdean Hill” and “Candlemaker Road”¹ the whins and broom (a much weaker plant than the whin) were, in April and May, worth coming miles to see. I think that a temperature below 15 degrees of frost (and 12 degrees in exposed parts) if it lasts for some time is fatal to whins. Of course in deep snow the whin is saved as, from the nature of the plant, the snow lies among the prickles and affords it a protection which the broom cannot have.

When a field fenced with these whin-dykes—in my day largely without the whins—was to be ploughed the first thing to do was to plough down the dyke. Though it certainly looked better, I do not think it paid, as it was a somewhat difficult and tedious process, the earth being little better than a tilly subsoil, and the ditches from which the earth had been thrown up often so wet as to require drain tiles put in. Where the field was not ploughed the bank and ditches remain as they were to this day, and form a splendid burrow for rabbits. One of these big whin-dykes extends right across the heather and, with the present fashion of driving grouse, forms a better shelter for the sportsman than any line of butts. The wood fencing was on the top of the ridge of these dykes, but as the soil was very dry and comparatively open, stobs never lasted but rotted very quickly at the ground surface and below it. When the fence required to be repaired I removed it to the side of one of the ditches and put up wires instead of the paling.

¹ North of second “E” in Legerwood, Map, p. 50.

At that time the Farm Roads, that is those that were fenced on both sides, were called "Statute Labour" roads. The Statute Labour by which they were kept up had had substituted for it an arranged money payment, and they were under the charge of a Road Surveyor for a certain road district. The man who had charge of our district lived in Melrose. He was quite a sociable old man, and I got him to sanction the new fences on the roadside. The



roadway, although reduced in width from what it had been, was much safer, and as it was not much used then and even less now it is still wide enough for all practical purposes.

The lowest part of the farm begins at the junction of the Boondreigh Water with the River Leader, where there is now an iron girder bridge at about 485 feet above sea-level. The Boon road rises sharply from the bridge up to 660 feet in the first third of a mile, and on the right-hand side there is a field named the Boon Mill Hill.

In the eighteenth century and the first third of the nineteenth, mills for making oatmeal were very common in the country, and different farms were bound in their leases, etc., to send their oats to certain of these mills. The miller took his profit in the form of multures, *i.e.* the retaining of a recognised quantity of the meal before sending it home to the owner. This custom gave rise to the position that

every two or three farms were "thirled" to their own mill.

As, in this district, the Marquess of Tweeddale had only two farms adjoining, and as these were detached from the main estate, they were "thirled" to Boon Mill. The mill was driven by water brought in a "lade" from a dam on the Boondreigh, and discharged into the River Leader. Even fifty years ago there was no trace of the dam, the mill, or any houses, but a few old ash trees mark the spot where the mill had been.

Boon Mill, as a mill, must have disappeared long ago; and not much wonder, as there was a more favoured rival and competitor within a few hundred yards at St Leonards, on the Lauderdale Estate. The latter would have five or six farms thirled to it instead of two for Boon Mill. It is only about thirty-five years ago since St Leonards Mill was closed; the ruined buildings are still standing though they now have the appearance of having been unused for an even longer period.

Boon Mill as a "farm" was a very different matter. The steading was at the top of the rise from the bridge and about half a mile from where the old mill had been. It does not appear that the last tenant of Boon Mill (as a separate farm) had anything to do with a mill at all, and the old mill buildings may have been taken down to form the Boon Mill Farm steading. As he is reported to have made a lot of money by growing wheat, both on his own farm and on adjoining lands hired by the year for that purpose, and to have purchased an estate in the Merse, it is just possible that, as it would be about the time of the Battle of Waterloo, he

wisely sold out and left it before the prices came down.

The second of the two farms was called Cribbs. It was about two miles from the main Boon steading (in 1872) and included a 50-acre field of the same name. The buildings of this farm stood just below a fine spring which now supplies water to Legerwood Manse, about a mile away. Cribbs Farm included also some outrun and a good, dry hill (950 feet) called the Cribblaw, which would be cropped as outfield land in the old time. There are now no remains of any kind except an acre or so of blackish, old croft land which indicates where the gardens had been.

An old roadman, with the good old Lauder name of Peter Vallance, used to tell me of two crofts farther east. Of these he recollected seeing the walls of the old houses standing when he was a boy. One croft, he said, was called Toddlerig, and the other Dowiedean. The latter is the name of a burn which now flows into Corsbie Mill pond, and is also the name of a moorland field on Corsbie Farm, corrupted to Dowden Moor, while a field on Boon, in which the burn rises, is called the Dean Field.

The present dwelling-house and steading for the whole farm of Boon, which was called, according to the advertisement and leases, "Boon, Boon Mill and Cribbs," was built nearly seventy years ago for my predecessor. His rent was £1200. He had four brothers, also farmers, in the parish of Legerwood, and there were only four other farms in that parish which did not belong to or were farmed by them.

The Boon tenants before my predecessor resided at what is now called Old Boon, and here also was his main steading and a large group of other

buildings. There were said to be fifteen farm cottages, a blacksmith's cottage, besides a school and schoolmaster's house. The schoolmaster was a Mr John Smith, but when the school at Old Boon was given up he was removed to be parish schoolmaster at Legerwood, about two miles away. His descendants are prominent inhabitants of a neighbouring manufacturing town.

The buildings must have been of a very rambling kind. The farmhouse, a large one, stood in a very exposed position at a height of about 920 feet. Placed on the highest point of that part of the farm it was a landmark for many miles round, and gave rise to the rhyme :—

“Gang ye up, or gang ye doon,
Ye'll aye gang up the hill to Boon.”¹

The water supply is the difficulty up there. It is obtained from wells about 28 feet deep, and a spring 200 yards away. One of these wells, that in the top south-east corner, fell in some years ago and is still a source of danger as it has never been filled up. The byres, some sheds, and a granary are all that now remain of the old steading, and the kitchen end of the rambling farmhouse is the only part left standing ; it has been made into a shepherd's and a spademan's houses. The rest of the buildings were taken down, and the stones were used to build the new house, cottages, and steading at what is now called Boon. At the same time the remains of the Boon Mill steading and houses were carted up for a like purpose.

¹ It is said that an old Bailie in Lauder once offered £800 for the farm, subject to conditions, but ruing his bargain, made the unusual condition that there must be a water mill, and so got off.

I have often thought what a handicap it must be to have a lot of such work to do besides that of the ordinary farm cultivation, and it must have been especially heavy on my predecessor. He had to do the carting of materials for his new house, ten cottages, and the large (modern then) steading, all of which were erected for him. He would have new roads to make, fences to put up, and all the carting entailed by the planting out in strips of about 60 acres of young trees. It was a colossal work for any man to undertake, over and above all the preliminary work of deciding where on a bare hillside everything was to be placed.

I used to wonder how my predecessor could have farmed Boon in the condition it was when I entered—such a lot of “finger-and-toe,” wet land, sprats and rushes instead of clover—but when one considered what he undertook and what he did, the marvel is that he accomplished so much successfully.

The proprietor, having bound himself to provide for him a new central steading and farmhouse, and roads to them, while getting from the tenant a rise in rent of £400 a year, was inclined to let the latter have a good deal of his own way in the choice of the situation and the architectural features of the new buildings, etc. I myself, after a long experience of it all, am not disposed to criticise very severely the general conception of what such a place might have been, and this one easily could have been, on larger lines. As an example of what I mean I think that, instead of making two grass paddocks of, together, $2\frac{1}{2}$ acres, it would have been simpler to have had two 10 to 15 acre parks, which would have cost less

and would have included all the stiff clay in the immediate neighbourhood. Again, the farm gives water for the threshing-mill ponds of four neighbouring farms, but the new buildings at Boon were erected in such a position that water for threshing there could not be got, and instead a steam-engine had to be put in to supply the power.

The landlord was a busy man with large estates and many other interests, so the details generally were left to his factor, the estate architect, the new tenant, and his friends and advisers. The factor of the neighbouring Lauderdale estate, who resided in Lauder, was asked to be Master of Works. The Marquess had a shrewd, practical, business mind when he chose to apply it, so when about £6000—a large sum in those days—had been expended, and the works were not nearly finished, he harnessed up a pair of beautiful black horses, bred and broken by himself, into his brake and drove the twenty miles from Yester to Boon, to see for himself. The consequence was, that after a call on the Earl of Lauderdale at Thirlestane Castle both his own factor and the Earl's, and the Yester Estate architect were dismissed. The result at Boon was that things were not finished off with the same thoroughness that had characterised the work up to this, and it took quite another £2000 to complete the work. While, no doubt, there was a great deal of reason for his Lordship's interference, there had been also much genuine expense in the cutting out of foundations, banking, and levelling that might have been avoided had a site been selected about 300 yards lower down the valley.

The former tenant's main idea was to have a

large cattle-feeding steading in the centre of the farm, and he got it—to say nothing of the labour and trouble it gave him in later years. This he must have found out for himself, as his experiences and worries, judging by his somewhat unfortunate habits and early death, would indicate. During the last year and a half of his lease, that is till the farm was given up in the year before the lease terminated, it was managed by his brother. He farmed one of the finest of the Merse farms, and the farm was no finer than the farmer. He was one of the best men in the county, and I owe a deep debt of gratitude to him for his unfailing kindness to me. A gentleman through and through, he was held in universal respect. On one occasion he said to me: “The worst of Boon is you canna get a level bit to put a ‘muck-midden’ on!” He and I carried through the whole negotiations of his leaving and my entry without a single hitch or an angry word. “It takes two to quarrel,” and my predecessor’s brother was not one of the two.

My predecessor had been offered his choice of one of two things for which he had asked. These were, either to have a gasometer installed which would light the houses and steading with gas, or else a bridge over the River Leader in place of the ford and wooden footbridge then existing. This last remained till 1873, the year after I entered. Unfortunately for himself and the proprietor he chose the former. I understand that the gas outfit was installed at great expense and trouble in the house, cottages, and steading, and that it lasted for about two years. After the second or third gasometer explosion—which nearly burned down the whole

steading—it was abandoned. It was left to me to fill up the old gas-tank, and I made it into a hen-house ; but later, when movable hen-houses came into fashion, it became a shepherd's cake-house.

It is not easy to put a "cash value" on the human feelings! The valuation of one's satisfaction and pride in work accomplished and well done may be the most difficult of all to estimate. One can, however, imagine the tenant and his young wife in their new house at Boon, beautifully lit up with gas of his own making, entertaining parties of friends and pointing out the beauties of the place (which, notwithstanding its natural beauty, must have been very bare at that time). We can picture him taking them out after tea or dinner to his cattle courts, and showing them his scores of fine fattening cattle ; his nine or ten pairs of fine work-horses in the stable of nineteen stalls all in a long row ; the byres, with his own and the farm-servants' cows—all lit by gas! The pride, as I say, of the young master in those days was difficult to estimate intrinsically. But, as it was so short-lived, I hardly fancy that, great though the pleasure would undoubtedly be of showing off the place under such unusual conditions, it was worth it even to them.

The immediate effect of my predecessor's choice of gas in preference to a bridge was that the latter was still unbuilt at my entry, and as it was a most necessary improvement the proprietor undertook the work of erection. The site of the footbridge, just below the ford and close to the junction of the Boondreigh and Leader, was chosen, a magnificent bridge was planned by the estate architect, and the contract for it was let to a Lauder man at about

£700. It had two arches and was built of the fine blue Lauderdale whinstone with red sandstone cornices and facings. It was a structure anyone might be proud of, and the work was splendidly done.

My father and mother were visiting me at the time of the building operations, but had been prevented more or less from getting about the district, probably because the latter was nervous about the ford. When the bridge was nearly finished, though the roadway approaches were only partially completed, my father said that as the bridge was now quite passable he would drive my mother into Lauder to make some calls. On the outward journey they were all right but, when returning, the gig capsized on the uncompleted road and threw them both out. Fortunately they landed on the soft material at the side so that neither was hurt. I met my mother walking up the hill carrying a rug, while my father looked after the horse and trap which, with some help from the navvies, he had got righted with little damage. The episode caused a good deal of amusement in that, after having passed so often through the double ford of the Boondreigh and Leader, the first wheeled trap on the new bridge should have been upset.

In 1888 we had a period of very rainy weather, and the ground, although drying up on the surface, was still very wet below. A sudden change of the wind brought a dark, scowling sky and some thunder, then the rain came down again in abnormal quantity, and further west it must have been a veritable waterspout. The River Leader rose to an unprecedented level and broke its banks in all directions except where it came

past St Leonard's Mill just above Boon Bridge. At an early hour in the morning the miller and his family were up, fearing that their house might be washed away. Seeing, however, that there was no immediate danger he turned his attention to Boon Bridge. The banks were holding, but the bridge itself was an obstacle keeping back the flood, the two arches insufficient to contain it as it came boiling through. All at once, as he still looked, both arches seemed to rise and burst upwards leaving the centre and end piers standing like single pillars in the volume of water. The bridge, of which we were all so proud, was gone for ever!

When the local Government Act of 1889 came into force I had asked the proprietor to join me in making an application to get the Boon roads taken over and made public, as all of them were used as "through roads." They had been partly private, that is, those which were made new by my predecessor were not recognised as public roads, and were therefore not supposed to be kept up by the "Statute Labour" assessment, though the bridge was so kept up. The wording of the clause regulating the liability was: "From . . . to Boon Entries"; but where "Boon Entries" were no one knew. I was a member of the County Council and the Road Board, so, when the landlord's application came up, I did my utmost to support it, undertaking to make the roads to satisfy the Surveyor and an Inspecting Sub-committee that was appointed. This undertaking cost me £70 to carry out, and after a time the roads were taken over. They have been of great benefit to the public ever since. An immediate saving to the tenant of over £25 a year and

a permanent advantage to the landlord was the result.

In the big flood of 1888 a number of bridges were washed away, and their reconstruction came to be a matter for discussion on the Road Board and the District Committees which ended in so much of the liability being undertaken by the former. The assessment thus being made all over the County gave a little relief to the District Committees. Then there came up the further and particular point that Boon Bridge being, as stated, a private structure and not specially mentioned when the roads were taken over, it was pleaded that no liability for its reconstruction should be admitted. Two points had to be considered. First, that the roadway of the bridge had been kept up by the Road Authority since the road was opened fifteen years previously; and, second, the impossibility of opening up the old ford. It was decided, independent of the farm of Boon, that the public were entitled to a bridge, so the proprietor was relieved of liability, and the erection of a new girder bridge was undertaken by the District Committee and County Road Board at a cost of £1200. The reason why the old bridge was washed away was that it was too small; another arch would have made it quite secure.

It is difficult to imagine, on seeing the quietly flowing Boondreigh and Leader, the possibility of those gigantic water spates, which come down from the hills so suddenly when the snow is melting or after abnormally heavy rains. Inconceivable as it sounds after the experience of the stone bridge, one winter only had passed before we found that,

owing to the climatic expansion and contraction, the whole metal structure of the new girder bridge had to be raised by hydraulic machinery, and a roller put in to allow for the simple laws of heat and cold.

CHAPTER XI

"FAIRS," SHEEP, CATTLE, AND HORSES

A FEATURE of the early times was that lambs were not sold in large numbers from farms like Boon which could grow the turnips required to winter them. The special point in sheep-breeding then was the length of time for which the lambs could be kept until the ewe-side was sold for breeding as gimmers, at about sixteen or eighteen months old; the wedders until they were dinmont sheep at eighteen or twenty months, when they were sold to the mutton markets of the South. My predecessor had nearly 200 wedder hoggets to turn into dinmonts at his sale in 1872. Naturally, where so many breeding ewes were kept, the whole of the season's lambs could not be retained over the winter, and a series of Lamb Fairs were held to dispose of this surplus. The largest of these "Fairs" were the precursors of the great Auction Lamb Sales which are held now. Horses, wool, lambs were often the chief items, and the site of the fair was usually set apart specially. The particular body or corporation most interested in the site was frequently vested with the right to make rules, to collect the market dues (which were payable by the sellers) and, generally, to arrange for the holding of the fair on the appointed day.

The first fair of the season was held on the 18th of July on St Boswells Green, and was for lambs, horses, and wool. Up to 1872 it had been a great fair for lambs, but, even by that time, it was beginning to fall off, as an "Auction Sale," which had been started in the neighbourhood, had drawn away from it large numbers. Some of the stock would be exposed first in the early morning in the open Fair and, if not sold, was taken later to the "Sale." The 18th of July is still St Boswells "Fair Day," and there is still a market there for horses and wool. The old paraphernalia of a fair still appears though to a lessening extent; the tents for refreshments, the "crames," the various "shies," the merry-go-rounds, etc., etc., still come as well as some old horses and a few younger ones. The usual bands of tinkers and muggers with their picturesque dress and caravans, many farmers, local wool buyers and those from the woollen manufacturing districts of Yorkshire, a few farm-horses and a horsedealer or two, all make up the usual medley for the early part of the day. As the afternoon advances the crowd increases, young people of both sexes and some older ones as well flock in from the villages and farms to see whatever fun and enjoyment may be going.

One of my earliest recollections of St Boswells Fair was of lunching in a tent on salt beef. It had been boiled in a copper pot which was not very clean, with the result that, along with about a hundred others, I was taken violently ill. I was unable to get about for a week after and then a change to the seaside at Spittal was recommended. As salmon was very plentiful and cheap that year

the landlady evidently thought that it "would be a nice 'antidote' to copper poisoning for a farmer from inland." But even salmon three times a day for ten days got too much for me, and I have never since had quite the same fondness for it!

St James's Fair at Kelso was and is still held on the 5th of August, on the old Roxburgh Castle Haughs on Tweedside. It is under the patronage of the Provost and Councillors of the county town of Jedburgh. Whether it also was ever a lamb market I do not know, but horses and wool are still sold there. As a market it is in even a more time-worn condition than that at St Boswells, but on the other hand, to keep up its popularity it has two very important events which take place on the same day. The first of these—the large and prosperous Border Union Agricultural Society's Annual Show of stock, implements, etc.—is held in an adjoining field lying between Tweed and Teviot, and between Floors Castle and Springwood Park. It is attended by all the proprietors, by many farmers and their ladies, and by most of the visitors who happen to be in this lovely district at the time. The other event of importance is that St James's Fair has come to be recognised as *the* Hiring Market over a large district for special and casual harvest workers. Here there is fixed (with reductions to meet the case of more outlying districts) what is called the "St James's Fair Wage." Like the fair at St Boswells held a fortnight earlier, it is a great resort for the country people in the afternoon and evening.

Old Lammas Fair, the largest lamb fair in the district, used to be held on the 12th of August on

the sides of the Eildon Hills above Melrose where now there is a golf course. In 1872 I had a great many lambs for sale on this "Melrose Green." The season had been, as I have mentioned above, a wet one, turnips were not looking very well, hay was being spoiled, aftermaths were poor and not ready for any large quantity of lambs. The unsettled conditions about markets—some wanting to buy at "auction sales," others on the "open green"—all resulted in a poor trade, and as I did not get all of my lambs sold some had to be kept for later markets.

It may be noted that there was a good deal of trouble and inconvenience in selling lambs at a "fair." The "market" began about three o'clock in the morning or as soon as it was daylight. The seller took up his position on the ground and fixed one sheep net at least, sometimes more, with which he had come provided, round his "lots" of lambs. He also required to have a large retinue of shepherds who had to keep lots from mixing and lambs from straying. A wet morning like that of the 12th August 1872 was the best thing that could have happened to advance the cause of "Auction Rings." Those who were introducing them were, at that time, only preparing to take up the business which the farmers were satisfied must very shortly be handed over to them. Indeed, many felt that this new method of selling was the right one, and the buyers were equally prepared for a change.

There were, of course, other big fairs in the south country besides those I have mentioned at St Boswells, Kelso, and Melrose, such as at Lockerbie and Hawick, to which some farmers sent their lambs. The auction

marts, however, gradually took away their business, though for some time a few small "fairs" still continued to be used for selling lambs—such as those of shepherds and a few small lots, such as at Lauder for the Bungesses' hill sheep, at Yetholm, Pennymuir, etc. Presently, however, the auctioneers got into the way of selling shepherds' lambs without charging these the usual commission, and now, except for a few lambs that are still bought privately at the farms, they have the whole trade which is well managed and beneficial probably to both buyer and seller. Even the small local fairs have become, so far as lambs and sheep are concerned, things of the past.

With the advent of the auction mart, now a fixture, the lucrative nature of the business and the competition thus created changed, gradually, the condition of the stock to be sold. Artificial feeding-stuffs, encouraged by the increasing demand for them, became more plentiful and were on the market at all times. Two results then occurred. The breeder sold his lots fatter on account of the extra feeding; the buyer, by continuing to use the same feeding-stuffs augmented by what suitable foods he could grow, was able to carry them on so that they were ready for the butcher in spring as fat hoggets, or as dinmonts in autumn. As time went on they were made to become fat still earlier, and instead of being sold off as hoggets in spring were ready in October, November, or at any time during the winter. Instead of the great autumn and winter trade of eighteen to twenty months' old dinmonts, there presently became a great autumn and winter trade in fat sheep which were a whole year younger than formerly, viz., six or eight months old. Similarly, the Black-

face wedder trade of many Highland hills has been changed, although I have not had any part in this.

What used to be considered the finest mutton (the three- to five-year-old Blackface wedder) has been put out of use and replaced with Blackface, cross Blackface, and Cheviot or other hill lamb at four to five months old. It is only a few years ago since I was looking over some notes taken by a lady student at one of our great Domestic Economy schools, when I came upon the teacher's remarks about "Butcher's Meat." These recommended "old Highland Blackface wedder mutton" as the best, and in fact *the only* thing to buy for the best joint. At the time the notes were taken *that class of mutton had*—except in very rare instances and only at special times—*been for years out of the market!*

The changes in the age at which farm animals came to be ready for the butcher are still going on, and it is now customary (even in store markets) for all kinds to be presented as nearly ready as possible. Many of these "stores" are killed in times of good trade when butcher meat is high. This tendency to use the meat of younger animals has been much more evident during the last twenty years than previously, and has had much to do with keeping up the price of store live stock of all kinds, but especially that of sheep. Early maturity is wanted, and supplied. Breeds that formerly were never reckoned on are bred now so as to be suitable for the needs of the times. The year between the wedder and the hogget, and between the hogget and the lamb has had to be made up. Whether the lamb

has made up the loss by increased weight, or by increased numbers, or whether the smaller joints purchased as a rule by the consumer are more now than formerly is any help, are points that merely occur in consideration of the subject. Most probably the sheep scarcity of the past few years, and perhaps also that of store cattle—if there be any such scarcity—as well, have been accentuated by the demand for this early maturity. As to cattle it should be borne in mind that there are whole countries—first Ireland and now Canada—breeding stores to compete with those of the home breeder, and of course these help to account for the change in the slaughtering age.

As time went on it naturally occurred that the demand for young mutton—with the higher standard of fattening asked for—was much less available. This was known as “Selling by Character.” If Boon lambs were not as fat and well brought out as others, they did not bring so good a price as they had got formerly. This would merely be because they were off a “high” farm; although well bred that did not seem to be much of an asset to warrant a higher price. The fact was that a buyer might make as much profit in a given time from lambs purchased from a lower farm than from the higher one. A ready profit and quick return made all the difference independent of which sheep would turn out to be the better eventually. Good breeding still tells, but what used to be thought an advantage in a high farm has, to a great extent, been lost, and some rents that have been paid in consequence of this have later been found to be too high.

The first change in the sheep stock at Boon, on account of the change of times, was to return to

the numbers of my predecessor, so fewer half-bred ewes were kept and more Cheviots. The big three-quarter-bred lamb was brought out more easily, while the big half-bred ewe was easier to keep lower down. The Cheviot ewe of the large type—which Boon had always been able to produce—required, I found, one-third less keep in winter than the type of half-bred ewe which one had to keep in order to produce the big lambs required. I found the Cheviot to be very prolific, a good mother, and in general more easily managed. All over, I could keep a third more of them and produce the same number of lambs. It was only very occasionally that I could spean more than 150 per cent. of lambs from the half-bred ewes, allowing for deaths during winter, eild, and ewes without lambs. For nearly all of the two-, three-, and four-crop Cheviot ewes we often had 150 per cent. of lambs from two-thirds of them. Therefore, as the half-bred ewe lambs could usually be sold at prices similar to those of the top three-quarter-bred lambs the results were equalised. I found that Boon was a suitable farm for the large type of Cheviot ewes, and that its elevation and climate were against the half-bred.

When the need for reducing the total expenditure—which was spent mostly on the arable lands, as I have mentioned above, including the turnip crop—became pressing, I resolved to get rid of my half-bred ewes and to buy in more Cheviots, along with a few pure-bred Border Leicesters and pure Suffolks which at this time had been newly introduced into the district. All of these received their proportion of the reduced turnip crop. The increased stock of Cheviots had now the run of practically the whole

of the sheep grazing on the farm. Though they themselves did become larger in size and better, I found, after I had made the change, that it was very difficult to get from them the number of lambs that I expected, nor even the large crops they had given previously. Instead of an average of 1380 during a former period of ten years it was reduced to about 100³ less. There may have been poorer crops of lambs all over the district, and the seasons were probably not so good, but it caused some thought. I came to the conclusion that as the Cheviot ewes had now the good pastures on the farm as well as the inferior ones—which they had had before—they were being kept in better condition during the season. While this was certainly evident, and we prided ourselves on it, it was more difficult to flush them in autumn as there was now no better pasture to give than they had had all the time. By being very particular and by trying various expedients we again got the numbers up to about 1400. Later on I had a good many cross-Suffolk ewes instead of the half-breds. I also tried to breed Border Leicester and Suffolk rams for sale, but as there were only a limited number of each, and as I required the best rams for myself—which did not need any forcing in the way of extra feeding—those for sale were always "seconds," and were never brought out as well as they should have been. Perhaps the real reasons were, first, a personal one; as I had not been brought up to this work, though often asked to act as a judge, I never felt myself to be an "expert" at what it required. Another reason was that with a large farm and two big hirsels of sheep for my two shepherds any additional

work, such as the preparation of sheep for special sales, would have required a third man. So, latterly, I gave up attempting to take any advantage in that way of the good foundation stock which I possessed.

By the time Oxford crosses came into the Valley to take the place of the three-parts-bred lambs I had given up keeping half-bred ewes in any numbers, and did not therefore have Oxford rams. When rams were required for crossing I used my home-bred Suffolks, which I have always considered to be the better sheep. So much was this the case that I was a member of the Suffolk Sheep Society for many years. The meagre attention which my shepherds gave at one time to the Suffolk flock emphasised my difficulty of curing, or keeping in check, foot-rot (I found that their black feet were very subject to it), and decided me to give them up, although I still used the rams when required for crossing. I was very pleased with the cross-Suffolk sheep, and indeed much preferred them to the half-bred of former days. I am glad now to find that as a breed they are coming more into favour, and are considered by many stockmen as not much, if any, behind the Oxford in popular favour.

About twenty years ago I happened to be looking at some Cheviot ewes in a pasture field, and saw one of them go up to a large boulder, several of which were lying about they having been dug up and put out of the way of the plough. It first rubbed its head on the stone and then, turning round, rubbed its tail and hindquarters. Presently another sheep did the same, and then, becoming suspicious that they might have got sheep scab in

some unaccountable manner, I ordered the whole lot that were in the field to be brought into the bught. Later in the day a thorough examination was made but no sign of scab, or any ailment we knew of, could be found. A few months afterwards some sheep-men began talking about what they called "Scrapie," a new, incurable disease that was rife in the district whence, every year, I got some Cheviot ewe lambs. It was, however, not till two years later that I connected my ewes rubbing themselves on the boulder with the "Scrapie" talked of, and by that time my flock had become thoroughly infected, if it were "infection." During the whole of the remaining time that I was in the farm I was occupied in trying to rid the stock of its effects, and it was not till nearly the end that I succeeded in reducing to reasonable numbers the sheep becoming affected each year. Although I could not say that my sheep were absolutely clear of Scrapie, my stock was, to all intents and purposes, "Scrapie-free." In my case treatment seemed to be of no avail, but to sell out and buy a fresh stock was a difficult expedient altogether as the disease was there in practically the whole of the country. It was, however, a very important step to breed always from home-bred stock which were known to have themselves been bred from old and proved sheep; while it lessened the evil and was helpful in other ways to sell the infected sheep whenever we noticed they were affected.

It may be noted that, at the time I changed from half-bred to Cheviot sheep, there were good, practical sheep-men on hill ground nearer the Border who still kept to the former as their breeding

stock. They were bringing them up as hardy as possible, considerably smaller, but lacking some of the properties which predominate in a half-bred sheep. As I have heard it put, the idea is that the Cheviot does not need turnips, and if the sheep that you do have require turnips as their winter food they ought to be a bigger, better breed than the Cheviot. In my case it came to be the small half-bred against the big Cheviot, and as a matter of preference I chose the latter. When we had learned how to manage them properly there was, I believe, the larger return as well.

When considering the question of the Cheviot ewe and the turnip crop, I resolved to give them a good trial. In the first year I took two lots of 100 Cheviot ewe lambs, and, after speaning, did nothing to pamper them in any way beyond keeping them living and going forward. In autumn this is sometimes none too easy. Instead of putting the first lot on the turnip break (about three weeks later than the half-bred had been put on it) which had been the usual practice, I substituted about 60 acres of the old, natural pasture in Boondreigh Haugh. For a long time they did quite well as they were the first sheep that had been there for many months. When, presently, a snowstorm covered the ground for a week with some five inches of snow, I sent down daily, fine tare and clover hay mixed, which they ate well, and they were still getting along alright. Then there came a sudden thaw, the snow disappeared and the green grass again appeared. I made sure that the lambs (hoggs by that time) got fresh hay at once, but they would not touch it and returned greedily to the grass. Next day three

or four were dead, and for several days one or two continued to drop off until, gradually, the others recovered.

The same thing was experienced with two other similar snowstorms which were of longer duration. It was not until February that they took the hay in any quantity in fresh weather, but by that time they were a sorry-looking lot, while about a quarter of the hundred had died. Although before the following autumn they improved a great deal, they were never, while I had them, within 10s. apiece of the other lot which had been on turnips, and which had had only three deaths instead of twenty-five.

In the second year I thought to do them differently, and put them on the remaining 170 acres of heather and rough, natural grass of the moor, giving them their tare and clover hay from the beginning of October. The weather was much the same as that of the previous year, the snowstorms and thaws alternating. The green gairs of the moor proved as fatal at the break of a storm as the Haugh grass had been, the hoggets were no better, while their wintering had cost a good deal more. In fact, the hoggs wintered in this way were unsuitable for my purpose and never grew into the big class of ewes which I required. While a small lamb will often turn into a fair ewe if well done-by in the first autumn and winter a poorly treated one will seldom do so. The result of the experiment was that I gave the Cheviots the turnips grown for them, and cleared out my half-bred sheep.

As, fifty years ago, I did not contemplate the possibility of writing this account of my farming life

at Boon, I am unable to give sheep and lamb prices during all that time, but I can show enough figures, taken from the actual sales, to give a fair idea of the ups and downs of the trade.

The advertisement, by Messrs Penny & Kay, of Boon Sale for 21st May 1872, shows what the sheep, etc., stocking was at that time :—

393	Half-bred ewes and gimmers and three-parts-bred lambs.
500	Cheviot ewes and gimmers and half-bred lambs.
60	Cheviot gimmers and Cheviot lambs.
146	Half-bred ewe hoggets.
180	Cheviot ewe hoggets.
180	Cheviot wedder hoggets.
29	Eild ewes and gimmers.
<u>1488</u>	

This made a total of, as above, 1488 sheep with their lambs, besides 35 cattle, and 40 horses.

The corresponding Sale List, by Messrs John Swan & Sons, for 18th May 1922, shows the stocking as it was fifty years later :—

250	Half-bred and cross-Suffolk ewes and gimmers, with cross-Oxford and cross-Suffolk lambs.
640	Cheviot ewes and gimmers (in regular ages) with half-bred and Cheviot lambs.
260	Blackface ewes (Flass, the Hood, and Rawburn stock) with Leicester-cross lambs.
200	Half-bred and cross-Suffolk ewe hoggs.
200	Cheviot ewe hoggs (bred on the farm).
10	Oxford, Border Leicester, and Cheviot rams.
<u>1560</u>	

making, as above, a total of 1560 sheep with their lambs, as well as 135 cattle, 50 suckling calves, and 25 horses. When sending to me, after the Sale,

the statement of results, Messrs Swan & Sons wrote: "This is the largest Farm Sale we have ever conducted, and we hope the result is satisfactory to you."

In 1872 the sheep were good and suited for the farm, and on the advice of my "Authority" I began in much the same way, but with more half-bred ewes and fewer Cheviots. The prices remained much the same, and were not subject to many changes, either up or down, for some years.

As Boon was, for the most part, a sheep farm, the cattle records were neither so even nor were they kept in quite the same way. The system in use was regulated by the fact that when the cropping was limited, straw for wintering cattle was always short, and with a generally growthy farm there was keep in summer for many more beasts than the short supply of straw would admit of being wintered. To lease high-priced grazing yearly, as many farmers required to do, was the last thing that I thought of.

There were two or three ways in which my difficulty could be met—besides the obvious one of growing more straw either by larger crops, which were often unprofitable, or by having a larger acreage, which was what one wanted to avoid. These were: sending cattle out to winter, or taking in cattle to graze in summer; buying cattle in spring or early summer and selling in autumn; keeping a hardy type only which would winter out and be also good grazers in summer. These projects were all adopted when circumstances made them expedient. The West Country plan of using as little litter as possible, of growing other stuffs, and even making use of stack-

silage as fodder appealed to me as feasible, but for two or three winters my covered courts were so filthy in consequence, and the stirks so hungry that I hated to have anyone looking round! I was told of other farmers elsewhere who brought their young cattle through on less than an acre of straw per beast—I tried it, to the extent of letting them die. In early April I turned cattle out to take what they could find, letting them stay out till the New Year; and I thought seriously of getting my cattleman from the Cumberland Fells because he would know how to do things! In the end I was adopting all the schemes I could think of, and then was only partially successful.

EXTRACT from the "*Scottish Journal of Agriculture*"—Board of Agriculture for Scotland, vol. v., No. 3, of July 1922.

About thirty-five years ago the breeding of cattle on a fairly extensive scale was adopted, with the expectation that by suckling calves and selling them in autumn the difficulties would be met. With this object in view I got a small pedigree Shorthorn herd to breed well-bred bulls. So as not to clog the experiment by over-capitalisation to start with, I bought a couple of scores of Ayrshire heifers, which could be got at from £6 to £8 per head at the time. During eight or ten years I found this class of stock do only fairly well, although replenished by the purchase of ten to fifteen youngsters every spring.

So long as the farm-servant householders kept cows of their own, I could generally count on getting a fair return for the cow. This system, however, had to be abandoned, as (first) the suckled cow was found to be a poor milker in many cases; (second) the farm-servants gave up keeping cows on any but a small scale; and (third) the cross calf, I found, came all colours, some grew, some did not; some had horns long and noses black; some did well, some not. In most cases, therefore, prices were unsatisfactory, but before the Ayrshire was given up the suckling of two calves

by each cow was tried. This was a failure also, as, on so large a scale, it took too much labour, and the Ayrshire, accustomed to be outside for eight or nine months, was not a very amenable animal, while to have calves always ready to put on took some buying when done to the extent required. The real difficulty of the Ayrshire was the very unsatisfactory nature of the average Ayrshire-Shorthorn cross calf from the usual east country buyer's point of view.

For some years I tried Cumberland Shorthorns with an Aberdeen-Angus bull with varying success, which depended largely on the mildness or severity of the winter season. The calves of this cross sold well, the cows milked well, better than the Ayrshires, and were good doers and quiet, taking two calves with little trouble. The weak point was the wintering out, which was not practicable in the prevailing winter weather. I consider that in the end I have now succeeded in getting the cow, which meets practically all the conditions, in a big, roomy Cumberland-Galloway. I admit that the proper type is difficult to obtain as, for crossing, I have found they must be pure. The difficulties are (first) to keep clear of the Ayrshire-Galloway cross which (the late Dr Gillespie notwithstanding) I have satisfied myself does not always produce the class of calf you want and the best customer wants; and (second) to have the bigger class of the pure bred cows which, even though I latterly bred my Galloway heifers myself, was not always possible.

It has often in the past been difficult to compete with the north-west of England and Ireland in breeding store cattle, but there is most room at the top, and up to this time the blue-grey Galloway-Shorthorn steer is very near the top. It perhaps does not quite come up to the Angus-Shorthorn, but the consideration that it can winter out almost as well as its mother, and the difference in the cost of keep of the two will easily keep the Galloway cross for the additional year which is required to make the two equally mature. Generally, however, I found the Angus cross unsuitable for my purpose, whereas the Galloway cross was markedly suitable.

My forty-five to fifty-five Galloway cows and heifers are never in the house, except for the week or two it takes for handling the somewhat wild Galloway calves, until they are reasonably quiet.

My treatment is to give a little hay when snow is on the ground, and always from about 1st February; and an additional 3 lb. of cotton cake, bran, or grains (whichever is cheapest) a month before they calve, say, from the third week of March till the grass comes. They calve outside, and unattended after the middle of April, and the loss is infinitesimal, averaging less than two calves a year, and one cow in three years. Some of the later calvers, after the grass has come, have too much milk, and occasionally have to have two calves put on, which is not difficult. I found them much better mothers than the Ayrshire or pedigree Shorthorn. The eild cows are a negligible quantity, and are always fat in autumn off grass.

Boon was not a good farm for horses of any kind. Some of the land was either steep or stony, or both; part was subject to wet spots, and part had open ditches running through it; all over there were a great many wire fences where they were liable to get their hooves broken, or damaged in other ways. While I considered, rightly or wrongly, that it was not a place on which to keep the most valuable horses of any breed, I did recognise that it was better to go into a court and halter a young one, than into a market and buy when necessity required. I also thought that it was better to breed those with a known pedigree than to have all sorts. Latterly, I did not quite like some of the more fashionable studs, and tried to breed only what suited my own fancy, or what would in my opinion be of most use on the farm. In "horse-breeding" I was not more successful than I would have wished to be.

At one time I had a few light-legged mares, and tried to breed some hunters. Occasionally I went to Cahirmee and other Irish markets to buy what I might fancy, but was not very successful. If I did happen to get a good one it was generally sold

as soon as possible, as I was unable to resist the "get-rich-quick" method of business!

The twenty-five horses of all ages sold at the sale ranged in price from £10 to £80, and averaged about £40. Eleven of them were Clydesdale Stud-book mares and fillies whose pedigrees were stated.

CHAPTER XII

PRICES OF GRAIN AND STOCK : BOOK-KEEPING

SOME notes of prices got for stock prior to 1879 may be useful.

A number of weaned calves, seven or eight months old, bought at Appleby in 1876, were sold at home just two years old to a big Yorkshire dealer of those days in 1878 at £34 each, put on rail at Earlston Station.

Another lot of thirty cattle, bought at Hallow Fair in November 1876 for £23, brought in May 1877 £32, 10s. from the same dealer.

A lot of young sheep dinmonts were fed about this time, as the then Member of Parliament—Sir William Miller of Manderston—had taken the popular way of ingratiating himself with his sheep-feeding constituents by presenting a handsome silver cup for the twenty best half-bred dinmont wedders bred in the county, to be competed for at Messrs John Swan & Sons' Earlston Christmas Show and Sale. Although I was not so fortunate as to get the cup, I was second, and sold eighty half-bred dinmonts at 84s. per head, a good price for these times when mutton was retailed in the shops at 9d. per lb.

Oats were running at about 30s. and over. In one of these years I had a 20-acre field of barley at about 700 feet above sea-level. It was cut on the third Friday of August, and threshed on the

fourth Friday—5 quarters of good barley per acre; at ten o'clock I drew the sample straight from the mill, got on to my horse and rode fifteen miles to Kelso, the market town of that day, and sold it to put on rail at Earlston Station. On the second Friday of September, a fortnight later—the Ram Sale day—I was paid for it, and returned home with £200 in my pocket.

Some years later, when I was bargaining for a reduction of rent under my new lease, I drew up from my books at the request of the factor, a short statement of comparisons in income and expenditure, which may show what we all had to come through in those times. All household and personal expenses are omitted; for comparison it shows prices alone, the quantities being the same at both dates, and are the actual quantities sold in 1873.

BOON COMPARISON FOR 1873 AND 1902.

(Stock and Crop are made similar for Comparison.)

Stock, etc.	Quantity.	1872-1873. (Actual Sales.)			1901-1902. (Actual Prices but not Quantities.)		
		Rate.	Amount.	Total.	Rate.	Amount.	Total.
GRAIN—			£	£		£	£
Oats	182 qrs. at	32/-	290	...	22/-	200	...
Barley	192 „	44/-	420		26/-	250	
				710			450
SHEEP—							
Lambs	45 score .	31/-	1400	...	20/-	900	...
Ewes, Gimmers, etc.	17 „ .	48/-	810	...	34/6	585	...
Wool	285 stone .	48/-	680		14/-	200	
CATTLE—				2890			1685
Fat	35 . .	£28	...	980	£17	...	600
				4580			2735
Current Farm Expenses—							
Less Household and Personal			2260	...		1600	...
Year's rent			1465			900	
				3725			2500
Available for Household Expenses, etc. . . .				855			235

Note.—No interest on capital, or personal expenses charged in either year.

In the early years of my farming I had an idea that it was absolutely essential to keep books of a somewhat elaborate nature; also, when possible, to keep a note of the expense incurred in growing each individual crop, and the amount spent on the different fields.

The first six months after I entered the farm were taken up with learning what to do and how to do it, so that it was not till after the second and third years that the ideas as to book-keeping were developed. As a matter of fact these were the only years in which they were carried out with anything like the fullness contemplated at one time, and unfortunately the books have all been destroyed. For a long time they remained as a record of good work abandoned, of slovenly, idle habits adopted, of a growing carelessness and laziness, probably also of an increase of worry, a certain amount of dejection and of unrealised expectations. In any case, every time one saw these old records there was a prick at the conscience that was not to be endured, a feeling that it should all be begun again but which one knew would never be put into effect. So they were burned, put out of the way, and life had one source of irritation the less. There is, however, no doubt that though abandoned, the mere fact of my having kept a careful note of events and costs for even this short time was most useful, and it put me up to many things that were very beneficial in after years, although a considerable allowance had of course to be made for changes in times.

I remember that I used to count the cost of a man and his pair of horses at 6s. per day, that another 3s. was ample for blacksmith and joiner, and

for interest on implements, and 1s. to the farmer: 10s. in all. I also learned what it cost to cut hay, to work it, to shear grain, to spread dung, in fact to know the cost of all the various pieces of work on the farm, and what should be paid to have them done by the piece—a most valuable thing to know. Of course the current prices then when wages were, say, 18s. per week, must be more than doubled now when wages may be 36s., while the slacker habits of the worker and the shorter hours have also to be considered.

Besides the Field Book, and a book in which was entered the work of the different farm hands for each week—often for every two days—there was what was called the “Boon Book.” In this there was a plan on which was marked the draining, with notes of the work done on special fields. This book was not burned, but, though kept up to date more or less, it is now of interest only to myself, perhaps to my successor in Boon, and the landlord or his factor.

During the first ten years my book-keeping passed through all the stages from the costings and work records to the usual double-entry, to single-entry, and lastly, to a very simple form, viz., a one-book record in two parts, receipts and expenditure. In the first part there were column headings for—

- (1) Grain: giving all the grain sold, the date, quantity, and price, and the money received.
- (2) Other produce: sales of potatoes, stock taken in for summer grazing, etc., etc.
- (3) Sheep: all sales of sheep, lambs, or wool.
- (4) Cattle.
- (5) Horses and pigs.

- (6) Personal and other cash : part of farm students' fees, and any income got from other sources than the farm.
- (7) Household : rabbits, game, rents, etc., and about half of farm students' fees, etc.
- (8) General farm expenses.
- (9) Totals.

On the expenditure side there were twelve columns :—

- (i) Rent and taxes.
- (ii) General farm expenses, which included saddler, blacksmith, and other tradesmen's accounts not for household, insurances, steam coal, implements, etc.
- (iii) Farm wages.
- (iv) Feeding stuffs bought.
- (v) Manures bought.
- (vi) Seeds bought.
- (vii) Horses and pigs.
- (viii) Sheep.
- (ix) Cattle bought.
- (x) Personal and other cash expenses.
- (xi) Household.
- (xii) Totals.

On each side there was also a bank column, the summations of which were not added to those of the other columns.

There were so few individual transactions with different people that to keep a ledger meant transcribing all entries twice, which was of little use and really only a waste of time. I kept a good pocket-book which formed my "Day Book," and recorded in it much more than merely my cash transactions. There was a daily weather record, a note of my own daily doings, cash spent or received, the general operations on the farm, etc., etc.—in later years these last were not in detail. From this pocket-book the Cash Transactions were entered in

INCOME.

1919.		Grain.	Other Produce.	Sheep.	Cattle.	Horses and Pigs.	Personal and other Expenses.	General Farm Expenses.	Household.	Total.	Bank.
15th Jan.	A. B. & Sons, 70 qrs. barley at 116/-	£ s. d. 406 0 0	£ s. d. ...	£ s. d. ...	£ s. d. ...	£ s. d. ...	£ s. d. ...	£ s. d. ...	£ s. d. ...	£ s. d. 406 0 0	£ s. d. ...
19th "	C. D., 2 young horses, £85 each	...	...	...	...	170 0 0	...	...	...	170 0 0	...
23rd "	E. F., for cartload, hay	...	4 0 0	...	...	...	...	...	...	4 0 0	...
23rd "	G. H., 10 cwt. "Golden Wonder"	...	3 0 0	...	...	...	...	...	...	3 0 0	...
24th "	White, Black & Co., 12 skins and 1 hide	...	...	...	...	...	...	...	...	...	...
24th "	Rent day, J. K. L., factor, half fencing a/c	...	...	4 12 0	1 12 8	...	...	...	...	6 4 8	...
28th "	Agric. College, repaid expense of meetings	...	...	...	...	...	...	29 7 1	...	29 7 1	...
28th "	M. N., for white qucy calved	...	...	...	38 0 0	...	9 5 3	...	...	9 5 3	...
		406 0 0	7 0 0	4 12 0	39 12 8	170 0 0	9 5 3	29 7 1	...	665 17 0	...

EXPENDITURE.

1919.	Rent and Taxes.	General Farm Expenses.	Wages.	Feeding Stuffs.	Manures.	Seeds.	Horses and Pigs.	Sheep.	Cattle.	Personal and other Cash.	Household.	Total.	Bank.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.

the "Combined Cashbook and Ledger," income in one part of the book, expenditure in another, each entry following the other according to its date, only the amount of the cash paid or received being put into its own column (see page 129).

CHAPTER XIII

AN AGRICULTURAL DEPRESSION

How often in the history of agriculture has this sort of thing happened. On one of the occasions when we were in lower depths of depression than usual a prominent sheep farmer remarked to me, concerning a neighbouring arable farmer whom he had seen working hard in one of his fields: "Whoever of us all has to go, 'X' (naming the man) will be the last to leave the Valley." Even with the utmost kindness and consideration on the part of the proprietors, many farmers, including even some of the best men, had to leave their farms from sheer want of ability to keep on. There were few indeed who, having taken farms in the '70s, did not need help, repeated help, and help again in the '80s and '90s. Some got it from one source, some from another, and happy then was the bachelor whose household expenses were small. Even now, in the Valley, there are many farmers getting up in years who might not have been bachelors to-day were it not for these difficult times.

The Government of the day, having been pressed to inquire into the reality and extent of the depression, as well as into the cause of and cure for these bad times in agriculture, appointed Commissioners and Sub-commissioners to undertake the inquiry, and their

visits were big events in the Valley. Mr John Clay, of Kerchesters and Wedderlie at that time, with the help of Mr James Hope of East Barns, were the local magnates who visited our district, and many of the most prominent farmers gave their evidence in the old Black Bull Hotel at Lauder.

The evidence varied considerably according to the political bias of the witnesses, while the Report itself was the product of the political bias of the majority of the Commissioners. After a long and rather vague reference to matters in general, the Report spent its force in arguments against hypothec, game laws, and similar, to the average farmer, unimportant matters. Thus, having "asked for bread he was offered a stone," or, in other words, asking for "seed and room and suitable conditions in which to grow it, he received gravel by the hundredweight" and little else. It was "Much din but little 'oo as the devil said when he clippit the soo!"

One farmer who gave evidence before the Sub-commissioner blamed—with a good deal of truth—the bad season of 1879 (of very unhappy memory to many who are still living) as being the beginning of all the trouble. In that year there was all the appearance of a famine if not for human beings at least for live stock. Owing to the bad weather both the straw and hay were useless for fodder; there were no turnips to speak of, and what there were, were no bigger than apples. It was of no use to buy store cattle or sheep in autumn for fattening as there was almost nothing on which to feed them. Since few wanted to buy any kind of stock after the late and bad harvest, the October and November

markets were cheap, while in spring it was only those who had anything to sell who found the abnormally high prices in April and May to be of any use.

Unfortunately these high prices were not confined to live stock. Seed grain had to be bought in large quantities and it also was very dear. Everyone was in agreement that the first thing that encouraged the exportation of live stock and grain from the American Continent was these high prices; and that the shipping of grain, stock, and dear meat were the real cause of the "Agricultural Depression," which lasted, more or less acutely, for over twenty years, causing primarily and at the same time rural depopulation, and reduced cultivation of the land.

Later, the readjustment of farm rents became a necessity, but as this was only a partial help it had to be accompanied by a more complete readjustment in the farmer's general expenses, and particularly those of his family and household. The cause was self-evident, and there was then and even now there is no remedy but one, viz.: the awakened Government interest in agriculture (at the time of writing), though the new Commissions can give only very partial relief. There are few who expect that any tariff can be imposed, for the benefit of the farmer alone, on the importations of any foodstuffs, because the foodstuffs from abroad are being carried in British ships—although profitably to the shipowners there will probably be in the near future opposition from U.S.A. shippers—and are being used to feed directly, indirectly, and at a cheap rate the industrial masses, who are largely in a majority in our land and are by far the most powerful politically. In con-

sequence, the policy that is to be most advantageous to these masses is the one which will be followed. Looked at impartially, is there really a solid foundation for argument that even Agriculture (which is taken to mean the landlord, the farmer, and the farm labourer) would favour any preference which would tend to raise the price of imported foodstuffs? Old food tins have now become nearly as prominent a feature of the rubbish heaps around fences as those in the vicinity of any mining village, even although they may not have been used for the same class of ingredients.

With the readjustment of the rentals, and, as already indicated, with the still greater question of their expenses, those farmers who were not compelled to give up their farms managed to keep going on, although in a very much more modified financial position. Establishments were reduced—no longer was the carriage and pair to be seen, while fewer hunters were kept—the old class of farmer disappeared. The easy life was gone, his hands became grimy and his shoulders bent from the manual labour he had now to undertake. And all because the colonist could grow the grain, the wool, the beef, and the mutton cheaper than he could. The shippers also had taken their toll; probably not very much in itself and in some cases only a return or ballast rate, but sufficient both to pay and to destroy the profits of the home producers. Thus, by allowing the “god of cheapness” to reign supreme it dominated the agricultural world, so that the landlord, the farmer, and the farm labourer became so impoverished as to be brought within sight of ruin. In this way, too, the most efficient and suitable health-recruiting

ground of the towns' population was in a great measure brought to nought.

It is perhaps hardly necessary to go into details showing the reality of this Agricultural Depression since, at the time it was really noted, but a few figures may illustrate its extent.

In 1876 the balance-sheet at Boon showed a credit of £1600. This sum was expended as it came in on farm improvements—liming, draining, etc.—but as later events proved it would have been better if it had been laid aside for the literal “rainy day” which, as I have said, came very soon in 1879. The balance on 31st May 1880 for the year 1879 to 1880 was a debit one of £1400. In regard to that figure it is only fair to say that it was the result of the farming by an enthusiastic improver of somewhat limited experience, and was also due partly to an exceptionally bad year. I was one of those who was frightened at the miserable prospect of keep for live stock, but as I was not breeding cattle then had not bought in any, and therefore had none to sell in spring. But this never happened again.

There have been only two periods of about seven years each between 1872 and 1922, in which there were reasons—as far as profits were concerned—for good cheer or light-heartedness on the part of the average East Border farmer. One was the first seven years, and the other was the last seven. In the first period there was, however, the falling financial mercury all the time; and in the second there was the Great War and its remnants. There have been times between these two periods when hopes seemed to rise, when things generally seemed

to do better ; when you began to look forward to "the next year," that if prices got up you would make so-and-so and cover the deficiencies of the past, to find, however, that—even though prices got up you had few lambs, or poor grain crops and little to sell, or a too-wet or a too-dry season—you were unable in some way to get the benefit of the rise.

CHAPTER XIV

LEASES

(a) RENT DAY.—Rent Day was held in the last week of July for the Whitsuntide rents and in the last week of January for those of Martinmas, the collection being made at Carfrae Mill Inn, which is situated on that portion of the Yester Estate lying to the south of the Lammermoor Hills. Besides the farm, which goes along with the Inn, there are eleven others for which rents fall to be paid there.

In a stuffy little room without a fire or only a very small one, from about noon till two o'clock, the factor and his clerk interviewed the estate workmen, collected rents from the blacksmith, the joiners, and the tenants of the farms, heard all complaints, and took notes of what was wanted. At two o'clock they went into the dining-room where a good dinner was served at once. In summer the menu consisted of roast lamb, duckling and green peas, strawberries and cream, while in winter there was hare soup, turkey, and plum-pudding; at both seasons whisky "as wanted."

After the *second* tumbler was drunk the factor used to say: "I am forgetting, Gentlemen. I give you "The Marquess!" When we had finished our glasses to the "Marquess" the conversation used to turn on to the "laird, his family, and what they

were all doing." When the next tumbler was "made" we got : "The Lauderdale Tenants" drunk by the factor himself; and whatever the state of matters was in reality we always heard from him that he was "pleased to be able to report to His Lordship that the Lauderdale rents had, as usual, all been paid, etc., etc." The youngest tenant had to reply to this toast, and in doing so he finished up by proposing the "Factor's Health," which was honoured in no niggardly fashion, the whisky and hot water of the early years and the grog of the later ones probably helping a little. Then the tea would be ordered, and until it was ready we would play "Pitch and Toss" in the stackyard. The evening was generally well on before the carriage and pair was ordered to take the factor and his clerk back to Gifford. Occasionally it was considerably later before some of the tenants got home. After the old factor died the dinner was still continued, but the days of the old-fashioned toasts were over, and, with them, much of the old familiarity and the fun also.

(b) LEASES.—It has always appeared to me that farm leases are in very many ways unnecessarily cumbersome, but they are the result of much consideration and experience. They are intended to safeguard the landlord's interests, while expressing what the tenant is to be allowed to do and has been able to bargain for to counterbalance the rent he pays.

The common and legal clauses are doubtless what have been found necessary, or at least advisable, from the lawyer's point of view. Probably some of the other clauses are useful for the one tenant in a hundred who is not going quite straight. While

there may be a few factors and land agents who do not hold very conservative views on general matters, there are almost none who are not *very specially* so when drawing up a farm lease.

In my first lease, that of 1872, there were about 4250 words, my half of the cost of writing it and a copy for myself being about £9. The first thing that I have to remark on specially about that lease is, that though I was then 24 years of age, and the money required to take the farm was my own, it seemed necessary to the law agents that my father's name should be associated in it with mine.

The "duration" was for twenty-one years. Breaks in leases were not thought of then.

The beginning was as to the houses, grass, pasture, and fallow at Whitsunday 1872, and as to the arable land in corn crop at the separation of that crop from the ground. The right to plant—up to 50 acres for shelter or otherwise—was reserved; planting to be on a plan to be approved by the parties and subject to an annual reduction of rent for ground so taken off. This planting has been done, but the reduction of rent was never fixed, being counted as part of the general reduction given on account of the depression and bad times.

Then there were the usual reservations, such as right of access to plantations, putting up and straightening fences, all minerals, and also the right to take ground for building, on payment of surface damage. The game was also reserved, but it was specially understood that as the farm was detached from the main property and there was no landlord's man, gamekeeper or otherwise, the tenant should have the right to the shooting.

The rent was £1465, "to be paid at such place as might be after intimated in the County of Berwick, in two equal portions, one at Whitsunday 1873 and the other at Martinmas following."

The incoming tenant had to take over all valid claims by the outgoing against the landlord; in this case these were very small.

A sum, not exceeding £3000, was to be expended on fences for any newly broken up lands, on tile-draining on the farm, and on building across the River Leader a bridge for cart traffic. As a matter of fact much more than this amount was spent, the above sum being all expended on drains. The drains were to be made in a manner and to a depth to be approved by the Marquess or his factor, and subject to their inspection.

The whole houses and buildings were to be accepted as in complete order and condition, were to be kept in the same complete order and condition, and were to be left so at the expiry of the lease (as the buildings were then only fifteen to eighteen years old this was not a very onerous condition).

The whole fences, including march and plantation fences, were to be upheld in complete repair at the joint expense of the landlord and tenant. (As a matter of arrangement, and as being the cheaper way, the work was done by the tenant, who deducted the landlord's half when paying his rent.)

According to this lease the arable land was said to be 988 acres, all of which was to be farmed according to the most improved system of husbandry, but specially, the tenant was never to take two white crops off the same land, or to have more than two-fifths of the arable land in corn in any one year;

two-fifths were always to be in grass, and one-fifth in fallow, but no beans, peas, nor potatoes were ever to be reckoned as part of the fallow-break. (All this detailed attempt to regulate the cropping meant making compulsory the five-course rotation, which I think it was never meant to be and certainly was never adhered to. From the landlord's side one was encouraged even to disobey it.

Another clause stated that "Grass shall be sown with the first crop of corn after fallow or turnips, with a mixture of not less than twelve pounds of clover seeds and one bushel of the best perennial ryegrass seed to each imperial acre, with power to the landlord or his factor to appoint a professed agriculturist of experience and skill to examine the quantities and qualities before they are sown and with power to reject them." (I fancy that only in exceptional circumstances would 12 lb. of clover and a bushel of ryegrass be a good seeding.)

Again: "No hay of any description, straw, chaff, or turnips shall be sold or carried off the farm, but shall be consumed thereon. On leaving, at the end of the lease, the fifth part of the arable land has to be left in fallow, once ploughed, both the value of the fallow and the ploughing to be paid for, and in one half of the tenant's waygoing crop of corn the landlord or incoming tenant shall sow grass seeds which the outgoing tenant shall harrow in and roll without payment."

Then followed clauses regulating the way in which the newly broken up land is to be treated. Had they been followed to the letter the ground would now be a waste!

The straw is what is called "Steelbow," and is,

accordingly, left without payment on leaving. The incoming tenant is not bound to take over the last crop growing on the farm at the time of his entry, therefore unless some arrangement is made in regard to the harvesting of it, the outgoing tenant is entitled to retain the straw required for heading the stacks. The latter also retains the barn, barnyard, three cothouses, and a house in which the shearers' victuals have been prepared during harvest, stable- and byre-room for six horses and three cows respectively, with pasture in summer and straw in winter for them for twelve months subsequent to the term of their removal, while the crop is to be threshed in such a way as to afford a full and regular supply of straw to the successor, but not more.

The whole buildings and the crops of corn and straw have to be kept continually insured against fire in the joint names of the landlord and tenant up to at least £4000, the premium to be paid by the tenant.

In the event of any difficulty the matter to be fixed by mutually appointed arbiters and an oversman.

There was no difficulty about this lease, except that the sum of money to be expended on draining, etc., was much too small, and, for the times after 1879, the rent was very much too large. Besides the money spent on draining, a great amount was expended on breaking up and liming large areas, not only of new land but also of the old arable land. The liming alone came to about 6000 tons, and cost more than 20s. per ton before it reached the ground. The money that should have been kept for the "rainy day"—which came on so early and lasted

so long—was all spent, and for years it seemed as if the farm would have to be given up, and that I would require to fall back upon my medical work after all. That a certain amount of sympathy was felt and shown by both landlord and factor was evident, but little could be put forward against their argument that they had accepted the offer of a tenant who showed, at first, abundant capital, and whom they had expected would be able to withstand a few bad years.

Two circumstances were, however, in my favour. The first was that as a good deal of land was in his own hands, the factor could not nearly make ends meet at the rents at which it was valued, while the landlord himself was experiencing to the full the difficulties of the times. The other circumstance was that if I had to give up there was no one at that time who wanted a large farm like Boon, except at about 50 per cent. reduction. Therefore, as there was no fault, rather the reverse, with the way in which the farm was managed, they could not “better it.” An arrangement was agreed upon, although a considerable number of years elapsed before it was carried into effect. In the agreement, payment for such things as land taken off for planting, value of dung in the last year, the value and ploughing of the fallow, etc., which, when I left in 1922 might have been valued at about £1200, were all taken off *in lieu* of the reduction allowed thirty years before. This arrangement remained in force until 1903 when a new lease was entered into which contained many clauses similar to those of 1872.

In this second lease the sole right to the game on the farm and also in the plantations was now

let to the tenant; a break at five years was also bargained for; the same clause as before was inserted in regard to planting a further 50 acres for shelter or otherwise, while all the general reservations remained unchanged.

As by this time the steading had become somewhat out of date, it was agreed that a sum of £600 should be expended on roofing cattle courts and making other alterations. With regard to upkeep of these buildings, and of fences, the same terms were used; they are "to be kept in complete order and condition as to the former and in complete repair as to the latter at the joint expense of the landlord and tenant, the tenant still doing the work and deducting the landlord's half when paying his rent."

The arable land is stated in the new lease as 921 acres instead of 988 acres; notwithstanding the tendency to allow more liberty to the tenant in the way of cropping, the old clause as to "Beans, pease, and potatoes not being fallow crops" was still inserted, while the injunction about sowing "12 lb. of clover and 1 bushel of perennial ryegrass per acre" was still liable to be enforced. As a matter of fact, when preparing to leave, these quantities were really adhered to in sowing out the pastures in 1920 and 1921. In one field, sown in 1920, the arbiter allowed £2 per acre for temporary pasture, while in another, similar, he characterised the seeding as being so unusual and out of date (though it was *in accordance with the lease*) that substantial damage!! was allowed for it to the landlord. No hay, straw, or turnips to be sold off the farm; the waygoing crop, allowed at 360 acres by the former lease, was restricted

by this one to 280, the difference of 80 acres to be valued and paid for as if in crop at the end of the lease.

Oral consent had been given some years before this lease was entered into to plough and cultivate parts of the old moorland, which had been improved under the first lease, on the understanding that a similar area of the ordinary cropping land would be left in grass. As this consent had been taken advantage of it was recognised by the factor as being such an improvement that it was embodied in the new lease, thus: "That the tenant may, during the first seven years, break up not exceeding 30 acres in any one year, from which he may take a crop of oats, to be followed by a crop of turnips, to be consumed by sheep, and thereafter sown down to grass without a corn crop."

In this way 160 acres were, in the first seven years, re-broken up, two crops of turnips were taken but none of oats at any time; the various areas were sown down to grass again, and after the temporary fences had been removed passed back into the fields from which they had been taken. Although all this was done at considerable expense, it resulted in a great improvement, and as the new permanent pastures were very superior, a considerable claim was made for them on leaving the farm. At the waygoing arbitration it was decided that, though there was an undoubted improvement, "the injunctions imposed on the methods to be followed as stated in the lease, even though the breaking-up was quite optional, made it a Contractual Agreement for which no compensation could be allowed!"

Clauses as to cropping both during the lease and

at waygoing, fire insurance, and other things were similar to those in the first lease. But in regard to "leaving" there was a new provision that "notice in writing shall be given by one party to the other at or previous to Whitsunday 1911, that this (1903) lease is to expire at Whitsunday 1913 and separation of the crop from the ground, failing which notice the lease shall endure from year to year on the same conditions but may be terminated at any time by either party giving notice to the other at or previous to any term of Whitsunday that the lease shall expire at the term of Whitsunday and separation of crop which shall first happen two years after the date of such notice."

In the autumn of 1919 I met Lord Tweeddale's factor in Edinburgh. He told me of some big sales of barley which he had been able to make that day, and that he proposed—as farmers were doing so well, and landlords were getting so little in and having such large outlays—that those whose leases were going on from year to year should be asked to pay a little higher rent. I agreed that this was reasonable, and that he would, perhaps, get some higher rents. Personally, though my lease was not out for at least two years owing to the above clause, I even thought I would give, if asked, a hundred pounds or so rise for a few years. I expected that the factor would call upon me to discuss matters (especially as he had never been over the farm, and in fact knew nothing, except by hearsay, about it). Instead, however, I received from him notice to quit the farm in six months, viz., at Whitsunday 1920. As it was worded in the letter: "According to a clause in the Agricultural Holdings Act which (he said) empowered

him to give such notice, though (as he put it) the Marquess did not really wish me to go after so long a tenancy."

I was, of course, much surprised by this notice, and replied that "I understood that I had to get two years' notice instead of six months," but that I was "taking advice on the subject." The Opinion of Counsel (the present Lord Advocate) whom I consulted was that my lease did not terminate for two years after getting notice to quit, which was as I had understood it. On receiving notice of this Opinion, the factor withdrew his "six months' notice" and gave me instead, one for Whitsunday 1922. Our relations after this episode were naturally none too cordial, and so, after making an offer to stay in the farm at a rise of 33 per cent., which was not accepted and was ultimately withdrawn on the advice of my family, I sold off and left Boon exactly fifty years after I had entered it in 1872.

CHAPTER XV

PROPRIETORS AND FACTORS

Boon and Corsbie are said to have been given as a dowry to Lady Mary Maitland, daughter of John, the only Duke of Lauderdale, when in 1666 she married John Hay, 2nd Marquess of Tweeddale. It was probably in this way that these two farms became part of the Yester Estate.

I have farmed under four Marquesses of Tweeddale, the first being George, from whom I got the farm in 1872. He was a big man in every respect, of commanding height and large frame. A great soldier, a Field-Marshal, and held the titles of K.T., K.C.B., G.C.B., was Lord-Lieutenant of the County of Haddington, and probably missed additional honours at Waterloo by being wounded very severely at the Battle of Niagara, while on active service in North America. He had been of great assistance to and was very high up in the Councils of the Duke of Wellington in the Peninsular Wars. For a time he held the post of Governor of Madras. It was said that he had the longest reach with his sword in the British Army of his day.

In his later years he resided for the most part at Yester, and was fully occupied in looking after his estates and other personal matters. The gardens, stables, and woods were of special interest to him,

while he led the way in tile-draining, deep-ploughing, etc., on his farms. He was a mechanic and inventor, and was said to be an expert meteorologist. Besides being a capable horseman he was an expert horse-breaker. In the latter connection he would get young horses, practically untried, put into his high-seated, wide-axled brake, then, taking them into a large grass field they were allowed to have their will until they got tired. Sometimes, however, it was he who got tired first, and it may be this that happened when he got upset, brake and all, into a deep pool in Danskin Burn in the policies. On one occasion he is said to have driven the mails from London to Haddington without halt or resting.

He was much interested in the drainage and improvement works at Boon, for which he was paying so much, and often sent his well-known and much respected factor, Mr Swinton, over to see what was going on, while once he came from Yester himself. I can testify now that many works were undertaken which, but for his goodness and encouragement, would never have been done. When the £30,000 which he had agreed to expend had given out and questions of further buildings, draining, or fencing arose, his answer almost always was: "Go on, I'll pay the half!" I do not think that everyone could get on well with him, but his "word would always be as good as his bond." He died in 1876 at the ripe age of 89. Succeeding in 1804 he thus held the title of Marquess for seventy-two years.

He had thirteen of a family, six sons and seven daughters. The eldest son, The Earl of Gifford, had died before his father, so the next Marquess

was Arthur Hay, Lord Waldon, but he held the title for little over two years. He was a bird fancier and had a very fine collection of bird skins. He was President of the Zoological Society and author of many books on Ornithology. He was succeeded by his brother, William Montague Hay, 10th Marquess, who was in the Indian Civil Service. He was Chairman of many Companies, including the North British Railway. Tall in person he looked what he was, an able, popular, good business man. He died in 1911, and was succeeded by his eldest son, the present Marquess. Shortly after the latter succeeded, Mr Swinton, of happy memory, who had been factor for over sixty years, also died. Thus the estates were under a new proprietor and a new factor.

Marquess William was more than once over at Boon, but he was not as interested in farming as his father had been. On one occasion when he came it had been a fine morning, but after lunch the weather changed and became threatening, while the wind rose. He did not go farther than just to see the nature of the farm. It was then about the worst of the bad years, and I asked him what he thought of it all. His reply was that he thought we had "both got hold of a big, white elephant!" Then he asked me if I would not buy it. As, however, I could not sell the land which I had at that time in Aberdeenshire, it was impossible, even though he offered to allow much of the purchase price to lie on the farm. I did not, at the time, ask the price, but, as I have said elsewhere, I expect it could have been bought for about £18,000. Although this Marquess was a great financier he

recognised that the ordinary laws that were applicable to his general business could not be applied to his tenantry, and there were few landlords more considerate, and few families more kindly than his.

During forty out of my fifty years' tenancy I was exceptionally fortunate in having such a shrewd, considerate, sympathetic, capable, and friendly factor to deal with.

Mr Swinton had been connected with the Yester Estate Office for about twenty years before I came in touch with him. He was a tall, well-built man and in the prime of life; with a pleasant smile and kindly manner, although in all dealings with him you were not long in getting to know where you were. All through, I had a great deal to do with him.

At first we had the outlay of £3000 of landlord's money on drains and fences. Then there were the painting and papering of the house, and the building of the large cartshed, of both of which half was paid by the landlord. The new bridge over the River Leader was all paid by him. Many other things required Mr Swinton's frequent attention, and he was often at Boon; his visits became something to look forward to for his knowledge and advice were most valuable. As he usually stayed for the night he became very friendly with my wife and family, and latterly, there were few visitors at Boon more welcomed than "The Factor."

I made a point of almost never asking for anything when he was visiting us. If anything were required I wrote to him. "Put things in black and white," he used to say. He was very positive, and if he said "No!" there was little chance of

his altering his opinion. At the same time he was never quarrelsome. As he got older he found the large amount of work in the way of valuation of property, which he was asked to undertake, somewhat exacting, and when these took him to the south side of the Lammermoors he often stayed at Boon, using my trap in which to drive about.

There were, of course, many occasions when Mr Swinton and I differed, but on his part he never forgot the difficulties and the troubles that farmers had had to come through in the '80s and '90s, especially on improved farms where the farmer's capital had been expended and was not drawing any interest. The experience of farming a very considerable acreage as Home Farms for the landlord was enough to convince him as to the position of matters for others. He had often refused the highest offerer for a farm, and always recommended as tenant the man with sufficient capital. He was certainly not the first to advise the proprietor to give reductions of rent to his tenants, and argued strongly—and, I consider, rightly too—against the landlord coming to the tenants' help in a temporary depression. When he found, however, from his own experience that it was not temporary, that land values made in the past were of no use, that rents for land coming into the market were dropping, and that certain large farms could scarcely be let at all, he recognised the necessity of meeting the existing tenants on the estates, and recommended treatment which was as generous as most. This was, not a general reduction of so much per cent., but the due consideration of the circumstances of each individual tenant.

For the last twenty years of our connection Mr Swinton and I were close and intimate friends, and no one could look for a better or more interested factor than he was. Though always strict in looking after the interests of the Marquess, he did it in such a kind, friendly way that he was a special favourite with the Lauderdale tenants. No testimonial was more willingly and gladly subscribed to than the presentation to him of his portrait in oils¹ on the completion of sixty years in the Tweeddale Estates office. A short time afterwards he died, and was mourned sincerely by all who knew him.

¹ Painted by Fiddes Watt, R.A.

CHAPTER XVI

SHEPHERDS—AND “GEORDIE”

SHEPHERDS, in a country like Lauderdale, are a class by themselves. Talking generally, they are a very superior one, though there are exceptions to every rule, and I have come across as objectionable shepherds as there are in any other class of farm-servants. Men of arrogant, opinionative, almost fanatical and unreasoning minds and manners, who are thought to be, and who also consider themselves to be, clever able men, just because they have collected a certain experience in the management of sheep, and of the hills and pastures on which they graze. They have got it so pat with all their limitations and ignorance until it goes forth as the law from which there is no redress and “no shadow of turning.” These men are the ones who oppose every reform, research and suggestion, every attempt to alter the system—that they and their prototypes have set up—as the unfailing standard of stocking and management in the sheep world.

I recollect a very well attended conference being held, not so long ago, at St Boswells, on various sheep diseases. At this a very able and enlightening address was given by Sir Stewart Stockman. Many hill farmers and shepherds were there. Many very excellent suggestions were made, and theories pro-



John Kirk, Shepherd, and "Toss"

pounded at the discussion which followed. A certain proportion, however, of the speakers uttered opinions and gave examples which would have put the spiritualism and occultism of Sir Conan Doyle and Sir Oliver Lodge entirely on the shelf; in fact, according to them, we seemed to be only at the beginning of the reign of darkness, instead of nearly at the far end of the tunnel where the light on sheep diseases was once more showing a little. Common Sense escaped out of the door and the rest was Chaos. The result is that research in animal diseases is being conducted now to a great extent behind closed doors, to the exclusion at least of the wild men so far as they are known, and possibly now Common Sense gets a look in.

As a rule I was very fortunate in the men who were my shepherds. Having a farm which was reputed to “make good sheep” I had to keep up to its reputation, and I think that my record of stock prices through the lease and especially at my waygoing farm sale proves that, in this respect, I was fairly successful.

My first shepherds were those who had been with my predecessor. The elder of the two lived at Old Boon, about half a mile away, and near the top of the hill, in what remained of an old farm-house. As the former tenant of the farm of Boon had died some time previous to my entry, and the farm had been managed by his brother (for the family), the head shepherd had had a good deal of say in the details of the management. Probably he resented the interference of a “new and ignorant usurper” in what he looked upon as his province. Although he was in the main a good man and an active one, his

sense of right and wrong (he was an elder in the Parish Kirk) would not allow of his varying much from the beaten track. He left after two years, but unfortunately took his junior away also. The latter, I considered, was the better shepherd of the two—this might easily be so because he was more amenable to and had more sympathy with the demands of a probably somewhat ignorant and impetuous youngster. Anyway, he was a good man and I often regretted his having left me. Many years afterwards I met him under somewhat peculiar circumstances.

I had held the appointment of County Medical Officer of Health for some time. By the instructions of the Public Health Authority, and on my own advice, I had prepared for an attack of smallpox (which epidemic had appeared in neighbouring counties, and was spreading) by the purchase of a second-hand brougham, for an ambulance, and furniture for a small cottage of three rooms which was leased as a hospital. The cottage was about half a mile from the nearest residence and 200 yards from the public road.

As ill-luck would have it, a case of smallpox occurred in the Burgh of Coldstream. A female tramp—presumably from across the River Tweed—had arrived in the Coldstream Public Lodging-house, with a rash on her which had been diagnosed by the Coldstream Medical Officer of Health as smallpox. As he was in private practice in the burgh and district, the matter was thus left in my hands, and the patient was removed as speedily as possible to my little cottage. Furniture was got together, nurses and provisions were procured, reports and telegrams were despatched intimating the outbreak to my own

and neighbouring Authorities and headquarters. The last thing that I had to do was to arrange for a neighbouring farmer to supply fresh milk for the nurses, and this he agreed to send, at a certain hour daily, to the corner of a wood about 300 yards away. The cottage was about ten miles from my home, and it was not until the following evening that I was able to see the patient and nurses again.

From the latter I learned that the whole neighbourhood was up in arms on account of a smallpox patient having been brought anywhere near them; some of the inhabitants had gone to the farmer and intimated that they would burn his place about his ears if he supplied milk to the nurses at the cottage. In face of this threat, which was real enough (the ambulance-brougham was, later, burned less than twenty yards from the door of the cottage while the inmates were asleep), the tenant refused to continue the supply of milk. What was to be done? While I was considering the matter with the nurses, a step was heard at the door. This proved to be “Jock,” my good old junior shepherd of 1872.

“Dinna bother your head about the milk, Doctor. I’ll be glad to gie you what you want. I’m herd here, and a’ live up at the auld steading through the wood there.”

“John Ford, ye shouldna’ have come here; ye should have sent for me; ye’ll get infection.”

“Hoots, what are ye talking about? Do you no’ mind I had smallpox at Boon the first year ye cam’?” So the milk difficulty for the patient and nurses was solved through the kindness and good-heartedness of my old shepherd.

There was a period during which I was none too

fortunate with my shepherds. I had a bad attack of sheep scab during the time of one of them, and an equally severe attack of parturient inflammation during that of another. Again, I suffered great loss on turning a lot of hoggets away to April grass; scores of them took a kind of indigestive trouble of the stomach and had to be killed; some only were saleable at a low price for mutton which, after butchers' and inspectors' fees were paid, did not leave much margin to me.

For about six or seven years a shepherd and his son had been doing fairly well, but as I had by that time learned a good deal myself, he, on being asked "to stay"—which was generally done about Christmas, a good five months before the flitting term on 28th May—replied that he had made up his mind to leave. He was "going to take a dairy; he thought he could make more by selling milk than by herding." "But," he added, "if you haven't thought of somebody, I think I ken the verra man for ye. He's a guid-brither o' mine . . . he married my sister. I ken he's leaving his place, because his maister's drinkin' sae badly that he's got into sic low water that there's been nae wages gaun for twa year . . . so he's leaving, right enough. He was about Westruther in his young days, in a smiddy, but took to herding. He was twice at Cattleshiel's at the Keppitlaw Hill, herding, and in atween he was at Broomdykes on the low ground. He has a son for young herd and a lassie, and a lot o' callants coming forrit. He's a good yin and affa like suitin' ye if ye dinna mind takin' a friend o' mine."

Mr Johnston of Cattleshiel lived in Melrose at that time, and as I knew him I wrote and asked

what he thought of John Kirk as a possible shepherd for Boon. By return of post he replied saying to “go and hire him at once and be sure not to miss him.” I wrote at once to John, asking him to meet me at ten o’clock on the next Friday in Kelso Square. There, a small, dark man of about forty-five, with a kind of a shy smile on his face, came up to me and said: “Are you the Maister at Boon? I was lookin’ for an aulder man!” As he wanted a “Sheep Wage” for himself, and a “Money Wage” for his son, while the daughter would work-out at the same wage which I was giving to the other women, we were not long in coming to terms. Riding home the fifteen miles on that winter’s afternoon I just wondered whether I had done a good day’s work or not. But, could I have looked forward for the twenty odd years during which the Kirks stayed with me, I should have known that it was the very best day’s work I ever did in my life. I am not ashamed to say that the tears were in my eyes on the day John left Boon.

I could tell many good stories of John. The relationship between master and servant on a large farm has seldom been more friendly, and my admiration for him increased as the years went on. He was below the medium height, and when his brother, who was servant to a big, stout, elderly gentleman about town, received bundles of cast-off clothing from his master, John also reaped the benefit in a small way—a large way in one sense, for he would appear on a stormy day in an overcoat many sizes too large for him. By way of making an excuse for the bad fit John would say: “Man, it has grand big pouches for carrying lambs in!”

He never seemed to be in a hurry. He and his old dogs—I remember especially “Toss” at one time, and “Laddie” at another—must have been young at some time, but I do not recollect anything precise about it. The dogs must have needed training and correction, but I never saw this given; the sheep must have been gathered some time, but one hardly noticed it. There was no fuss about anything; yet, things were done when they should be done and in less time than usual. Other shepherds had generally two dogs with them and a powerful flow of language. You would hear: “Oh, ye muckle slaverin’ hash!” or, “I’ll thraw yer neck when I come till ye!” or some similar threat long before you saw the man or his dogs, but in spite of this neither sheep nor dogs seemed to care in the least. It was not so with old John Kirk, or young Jack, his son—with certain differences of character the latter was as good a herd as his father, and had an equally sterling and likeable nature—their dogs did not seem to need any training, for work came naturally to both man and dogs.

I have often gone some distance to see sheep-dog trials, and have been a member of the society running these events, but I have never, that I can recall, seen dogs working with such natural intelligence as that of two which were on my farm at widely different times, both curiously enough called “Spot.” One of them belonged to Jack. During lambing he had charge of the “outside” Cheviot hirsels. I was often near at hand at these times, and again and again I have admired the “bughting” of a single ewe that was wanted. A little group of sheep would be cautiously brought up to the bught; then

“Spot” became alert. “That yin, Spot,” shouted Jack, “that yin, man,” and before you could conceive it possible a wild, Cheviot gimmer was in the “parrack,” and in a second the flake-gate closed.

“Jack, that was good work,” I would say.

“Oh, aye,” said Jack, with the caution of his nationality. “He’s no bad, whiles.”

I have always considered that a “leasehold” farmer—as nearly all of us were in Lauderdale—had two main interests besides the arable land. These were the sheep and the pastures, and I think the latter were often more or less neglected. It was with the object of keeping the pastures “always on the mend,” so to speak, that I was induced to try, very tentatively at first, a change of grazing. This was, in fact, the beginning of what I went in for with such good results later, viz.: a system of “Rotation Grazing.”

The interest of the shepherd in the pastures is, naturally, a very pronounced one indeed. The question as to where such and such a lot of ewes with twins, or those with single lambs, and the hoggets are to be put for the summer is of paramount importance to him, and its consideration has occupied a lot of time, and occasioned considerable thought on his part. As a result, it generally ended in the cattle and other animals being more or less ignored or else relegated to the worst portions of the farm. It came, therefore, as a shock to the shepherd to be told into what fields certain classes and ages of sheep were to go, and what fields were to be left for cattle, etc. The explanation “why,” put in as good a way as I could, has invariably been met by: “Aye . . .” “Aye . . .” as the

explanation went on. In John's case it was of course met with the usual "Aye," but was accompanied by a smile which increased as I progressed, into a merry twinkle and a doubtful "Oh, aye," instead of "Aye."

Thinking to myself: "You won't do what I want, you old beggar," I went home and wrote out the stocking carefully, field by field, on a sheet of blue writing-paper. The arrangement of the stocking entailed some guess-work on my part, and in fact was a case of "counting your chickens before they were hatched," as I had to apportion room for so many twins, singles, or hoggets; so much for cows and horses, for big cattle, for stirks, etc., according to the different fields. When completed I took the paper out to the lambing field, and handed it to the shepherd.

"John, that's a paper I have made out to show where I think the stock should go. You and Jack can look at it at your leisure." John folded it up carefully, and putting it in an inner breast pocket, replied:

"Oh, aye. I dinna think we are to get as many twins as we would like. . . . The ewes are fatter than I thought; they're lukin' weel enough, but there's a lot o' singles. . . ."

During the next two days I was away from home, and it was Sunday forenoon before I got out to the lambing field again. It was a lovely April day of sunshine, and all the hedges showed bright green. There I found John, smiling as usual. He was leaning up against one of his "bields," wearing his "giant's overcoat," "Toss" at his feet.

"Well, John! How are you getting on?"

“Oh, fairly weel. I was juist lukin’ up the valley there, wondering how they were a’ gettin’ on. We’re no’ gaun to have a very big crop of lambs, ye ken.”

“Well, we canna’ help it, John. Those we have will be all the better, bigger, and fatter; and if other folks are like us, there may be fewer to sell, and the price be higher.”

“Aye, maybe! Ye see that muckle, fat bung lying chewing her cud, ow’re there? I thought she wud surely hae twins. I went ow’re till her, and I took the ‘blue paper’ and flappered it twa ’r three times in her face . . . but she juist lambled a single yin, after a’!” I have never been taken down in a more masterly style than the way in which John did that morning. We laughed and laughed again till I had to leave the field, and I am laughing now as I recall the incident and the man.

Boon, for about a quarter of its area, is probably the stormiest farm in Lauderdale. It lies, like the handle of a walking-stick to the stick itself, just at the angle where the River Leader, after flowing five or six miles in an easterly direction, turns due south. The High Ridge (from 900 to 1070 feet above sea-level) which forms a large part of the farm is thus exposed to the full force of the gales which come down the valley from the north-east. The folks at Old Boon, near the top of the hill, grew weather-wise about coming storms and felt them much more severely than we did living at Boon in the hollow.

One morning in the end of March the shepherd (before John) came down from Old Boon about eight o’clock, and inquired at the door for me. On looking out of the window I saw that there was

only two or three inches of snow showing after a rather windy night, and I went along the passage to the kitchen, whistling.

"Ye dinna need to whistle this morning . . . there's five or six score o' the hoggs buried in the snow, and a' the rest are driven ow're the top o' the Girridge Hill fence into the wud. At least, there's about a hunder and twenty awantin'. Mercy, ye dinna ken ye're born doon here! It's been a terrible night o' dry snaw, and drifted eight or ten feet deep up wi' hus."

On a good many occasions in later years we had sheep buried under snow, but never such a bad instance as this. With the help of all the men on the farm, and all the whisky, we rescued them by about four o'clock in the afternoon. We got out some fifty or so by watching for little mounds of snow, or any movements where the wreaths were less deep. The dogs also were of great help; when they scraped with their paws, or whined, we were sure there was a hogget below. Some of us had long feering poles which we pushed down into the 9 or 10 feet wreaths, and if we struck a sheep it moved or gave some other sign of life, and the men who followed us up dug into the snow and rescued it. With the poles and the dogs we were never at fault. Fortunately, in the afternoon we came upon thirty sheep that had been huddled together by the force of the gale and been stopped by a plantation fence. The hedge there had kept the snow from drifting so closely about them, and when released they jumped out of the hole of their own accord. I felt very thankful when we had found them nearly all safe. Two were dead, and four

somewhat weakly though they eventually recovered. These late storms do great damage as they come unexpectedly during lambing, and the sheep are not as fit as usual, when winter food is running short, and spring grass backward and not available.

I recollect one pretty late drift, followed by cold weather which prevented the snow from melting. In it we lost a three-weeks-old lamb whose mother would persist, for nearly two days, in returning to the same wreaths. When at last the dog found the place the lamb was dug out, very hungry and thirsty, but eventually it proved to be none the worse. There are far more wonderful hill records than these, but this is mostly an account of my own experiences.

For many years past we have not had very much snow, and no frosts to speak of, so much so that the old times, with the “lying storms” of long ago, seem to be pretty well at an end. Whether it is that the climate has changed or not I do not know, but the storms of late years, though occasionally wild enough at the time, have been of shorter duration. There was one winter when my wife was hardly outside the door for three months, and then only on horseback; and the year when our third little boy was taken from us, the road to the churchyard had to be cut with a snowplough, and the coffin carried in a cart, whilst many of my good neighbours attended the funeral on horseback. That day was one of the early days of a storm which lasted for many weeks. In those times the winter was looked upon with a dread which is unknown in these later days.

On one occasion my wife and I, with some of

the bairns, had gone to spend Christmas with friends in Glasgow, but although the weather was rather nice in the west, a prevailing east wind being the most probable cause, the newspaper reports began to tell of wild weather in the east, which culminated in the wildest snowstorm for years. All trains east of Edinburgh were snow-blocked, and telegraph wires were broken down. I went to the North British Station in Glasgow to make inquiries, and gave money to an official with which to telegraph to me when the line to St Boswells was open again. Two days later I received a telegram in the morning saying that a train would be sent out Hawick way that afternoon. By starting from Glasgow at once, I arrived at Waverley Station shortly after ten o'clock, and found that a train was to leave in about an hour to try and force its way to Carlisle. By this train I arrived at St Boswells, but it was not till two o'clock in the afternoon that I reached Earlston on the Berwickshire branch line. How, from there, to accomplish the seven miles to Boon was the problem. Walking on a road blown up with snow was impossible, and I had just persuaded the inn-keeper to lend me a horse on which to try and ride home, when, to my great delight, my groom appeared with my two riding-saddle horses. He had been sent to Lauder to get provisions for the people at Boon, only to find that the place was nearly destitute of food. He had then forced his way to Earlston, and after terrible experiences, tired and exhausted, he had just arrived.

My first question to him was: "What about the ewes, Jack?"

"Oh, they're a' right. . . . In the Clayshott field

I think. Jack Kirk had them a' gathered afore morning o' the first day o' the storm. I heard them saying he was out nearly a' the night."

After a good feed to man and horses, and with two sacks half filled with bread, etc., we started on a most memorable ride home. We rode through wreaths nearly as high as the horses, stumbling and slipping through the soft top-coating of snow on to the hard layer beneath, and although very exhausted and breathless with our exertions, we arrived at Boon between seven and eight o'clock on a moonlit evening. The sheep were all right; my thirty scores of ewes had been saved by Jack on the first warning of the storm. I did not get much of the story from him, nor even from his father, but I heard of it from others.

It would seem that, early in the afternoon of the day of the storm, Jack thought the weather looked bad from Old Boon, and he had then collected the ewes from two or three fields and put them together. When he came in to Old Boon about two o'clock his wife gave him a cup of tea; but he was restless, the snow was beginning to fall, and out he went again. What the details of the operation were I could never quite find out, but it is certain that Jack alone, with his two dogs, collected the ewes from the moor, and from seven or eight other fields on the high parts of the farm. The road between Old Boon and Boon is easily and early blocked, and he had no one to send to tell his father and brothers to come to his help. Those east-wind storms often attack the high lands at Old Boon, while the low-lying part of the farm knows nothing at all about them.

It took Jack and his dogs until early the next morning to get the sheep all into shelter. Nearly spent, and worn out with anxiety, he managed at last to stagger home in the early hours. *But the work was done.* Here was a conquering hero, who had no thought of self, no thought of reward, and all was done for a master who was away from home. Any attempt at extra remuneration seemed paltry.

Months later, at lambing time, when neighbours were talking of "dead lambs," "'kebbed' ewes," "things no' gaun well at the lambing," I pointed out to Jack that the luck we were then having, which was denied to others, was all owing to his care of the ewes on that terrible night between Christmas and New Year.

The Kirks stayed with me at Boon for over twenty years, and when they left in 1898 I was not very fortunate in some of their successors. Later, however, I got two brothers, one of whom was a very good shepherd. They were hired on a "Money Wage" (£45 and £40 each), and I was sorry when, after six years, the elder brother left and went to a neighbour. He remains a friend of mine and is a very capable man.

The next shepherd stayed with me for three years only, and I next got a nice family, who later took a small farm in a neighbouring parish, and are still there. While with me they had big wages, but, except that they have probably a more independent life now, their financial position will not be much improved. They had a cow, fifty Cheviot ewes, and sixteen hoggets. As the ewes were good, bringing with their lambs high prices at Boon sale a few

years later, their little farm could not, I think, have done them any better.

Following them, I got one of the best shepherds in Lauderdale, with a wife and young children of the same type. He was a great favourite with everyone. I used to think “Willie, the herd,” was, as a shepherd, as nearly faultless as any man I ever met, and his name was a household word with every member of my family. I have to acknowledge my great indebtedness to him, and also to his brothers who, when he died, succeeded him and carried on his work to the end, for their special attention and admirable finish to the stock of which they enabled me to reap the benefit.

For men like John and Willie, wages, however high, are but a poor remuneration for the services they render. In the lambing season of 1916, during Willie's time, we had the biggest and most disastrous snowstorm that I have ever known. At Old Boon, 900 feet above sea-level, the snow wreaths were *nineteen* feet deep, and at the lambing shed nearby all had a terrible time. Roads were blocked, and the shed and shelters were full of snow. About 18 inches of snow fell without intermission during a whole day and a night. We lost outright over 150 lambs, and some 70 hung on for a bit but never really rallied. I cannot say what it might have been had I not had a capable man whom it seemed impossible to tire. A young man of 35 years when he died of peritonitis following other trouble, he was deeply mourned by all who knew him, and by none more than my own family. He was the owner of another dog called “Spot.” He seemed to look on it as an extraordinary insult if

he were asked to sell Spot. His boys were brought up to be shepherds very young, and on very busy days one of the little fellows would be sent to return a lot of sheep to their field. On my saying to Willie "Will he manage them?" Willie replied: "Oh, aye. He has Spot wi' him!"

As with the shepherds I had many changes among my stewards, but one, the sixth and last whom I had, was, on my recommendation, presented in 1921 by the Highland and Agricultural Society with their "Address and Medal" after "Thirty Years' Faithful Service." He is still Steward at Boon with my successor there.

"Geordie" was a first-class horseman and came as a ploughman in 1892, and five years later I made him steward. He was one of the most active men I have ever had and the most even-tempered. To me, personally, he has always been a "good and faithful servant," and a true and cheerful friend. At the beginning he had no preconceived notions of a steward's duties, and did things always as I required. Latterly, he knew so well how to get things done as I wanted that he saved me many worries, and when so many men went to the War, leaving the farm short of labour, he was a host in himself.

CHAPTER XVII

SPORT

IN 1872, when farmers were fairly well off and landlords were more or less wealthy, Lauderdale was quite a sporting place. The local proprietors at that time were, however, not great sportsmen.

The Earl of Lauderdale, then Admiral Thomas Maitland, had only one daughter, and as he was an old man, without any other near heir to all his titles and estates, he lived so as to leave as much as possible to his daughter, Lady Mary, for a dower. This he must have succeeded in doing, for, when he died, Lady Mary (then married to the heir of the Earl of Meath) heired over £400,000. No more had been spent on the estate than just to keep things going in a very parsimonious way, so beyond a certain "encouragement" which cost him nothing, sport did not benefit very much by the Earl!

The Marquess of Tweeddale was also an old man, but though keen and able, the larger part of his estate in East Lothian, the Yester Estate proper, was all he required to occupy him fully, and to this day some of the best shooting in Scotland is to be found on the Yester Estates.

There was also that great sportsman, the Earl of Haddington, of greyhound coursing and fox-

hunting fame, whose estate—the Mellerstain of the old Berwickshire Baillies—came down to Leaderside in Earlston parish. But as he lived for most of his time at Tynninghame in East Lothian, or at Arderne in Cheshire, sport in Lauderdale had only a secondary or reflected glory from him!

In the lower part of the Valley the landlords and sport were represented by Captain Cotesworth of Cowdenknowes, Colonel Meiklem of Gladswood, and Mr Todd of Drygrange. Chapel-on-Leader House was inhabited only by occasional tenants, while the proprietors of Spottiswoode and Carolside were both widow ladies—Lady John Scott and Mrs Mitchell, afterwards Lady Reay. On the whole, though all the proprietors were sympathetic, sport in the Valley did not depend much upon them.

Probably the primary sport now in the East Border country is fox-hunting, and at that time it was exclusively carried on in this district by the Duke of Buccleuch's pack of hounds from The Kennels at St Boswells.

In the early days some of the young farmers and farmers' sons kept their hunters, and when the "Meet" was in their neighbourhood were frequent followers of the Duke's hounds. It was, perhaps, not so expensive for the followers nor so exclusive a sport then as it is now. A black hunting-coat and a pair of fashionably cut riding-breeches were not essential then; and some of the hunting "ladies and gentlemen" are still inclined to, conveniently, forget—when they meet someone not so well "turned out" as they are—that it is entirely by the goodwill of the farmer that there is any fox-hunting at all. There was a well-known farmer who used occasion-

ally to appear at the "Meet," with a strap buckled below the knees of his ordinary walking trousers, and who often returned home with the "Brush," the "Mask," or a "pad"!

For a time I stopped hunting but began again when Messrs Charles and Joe Plummer were permitted to start hunting a part of the Duke's district with a separate pack. As "times" had now become much harder and I was older, stiffer, heavier, and less enthusiastic, while my time was much more occupied, it was only when I had a sufficiently good horse that I "followed" at all. The horse that would hack, hunt, and go in harness was not easily found.

Once I had intended going to the Lothians where some young riding and driving horses were for sale. A farmer, with whom I was acquainted, was to go with me though he did not want any horses for himself. When, at the last moment, I found I could not go I asked him to buy a horse for me as he had other business there and was going in any case. The sale was a very cheap one, the horses not being what many people wanted in these bad farming times. My neighbour bought a good four-year-old for me, which was not quite perfect in appearance, for under £20. In "Hector," the horse in question, I got a good and useful animal and I had him for many years, often riding him for long distances. When we arrived at Newton Don, or Groundistone Edge, or Sunderland Hall, all long rides after following the hounds, he was not as tired as I was. One of his forelegs was a little bent, an accident which had happened at foaling. He had the finest temper and the best

manners I ever knew, and was absolutely safe in any kind of country. Among his masterpieces was that of going beside the driving mare in the wagonette, when the roads were bad; another was in coming home through snow wreaths during a storm. He was in his prime at twelve years old.

As I always found it difficult to get the class of horse that would ride and drive well, I went once to a large autumn sale in Cumberland of young, unbroken horses. Some of the breeders who were there told me they had put a good, strong Fell pony mare to a thoroughbred horse with, however, only a fair result occasionally. There is a certain amount of luck in buying unbroken horses, so I got four of them, with the idea that out of the four I would get *one* that was good. There was a bay which, when broken in, looked too small and when put into harness took after her mother, running with her head too low. As she was fast and had good action the local joiner fancied her, and she lasted him for ten years. Another one looked too heavy to ride so she was sold to a Galashiels baker. The next was a grey cob, which turned out to be the one I wanted, and everyone knew "Dick." He drove equally well double or single; hunted, but was never fond of jumping, though it was astonishing how he "got through"! He carried my sons or my daughters to their and his satisfaction, and was handsome enough to take prizes at Lauder Show till he could take no more!

I remember once being out on Dick when Mr Plummer's hounds "met" at Morriston. How it was I do not know, but I got on the wrong side of an ugly, black-looking bit of water with an

impossible, over-grown hedge round it. Some boys, not far off, pointed at me and exclaimed: "Eh, there's ane soomed the pound!" I held up my head and rode round to the nearest gate, with the feeling that if I *had* "soomed the pound" it was enough for one day, and rode home. I have had many a good day on Dick, and some long rides home, such as from Gilston, or Pogbie, or Longformacus, but he was not as good a "hunter" as Hector had been. Later, I gave it up altogether and let my daughters and youngest son carry on at hunting. They broke in their own horses, and were all more expert horsemen than I was.

While the successors of the old landlords are mostly "hunting" men and women, only a few of the tenants or the new occupying owners now hunt owing, for the former, to the very bad times during the last few years, and in spite of the greatly increased facilities, to say nothing of the very hearty welcome which awaits them from whatever "pack" they may elect to join. But the farmer's leisure time is less, his work is harder, and his purse emptier. But given better times the spirit still is willing.

A prominent West Country gentleman, when talking of fox-hunting, expressed the opinion that it was a "doomed sport," as farmers would not long tolerate moneyed men riding over their fields and damaging their crops and stocks. This opinion was given more than twenty years ago, and there is more hunting now than ever before.

In the south-east of Scotland and north-east of England there are few farmers, farm-servants, or villagers who are not interested in welcoming the

hounds when these are in their neighbourhood. When I was strolling out to the "Meet" at a neighbouring farm not long ago, a grocer's van stopped beside me and a voice exclaimed: "Have a lift, Doctor?" The van was empty of goods! The grocer who was driving was probably open to take orders by the way, but his main object was to see the hounds "laid on." Long may such interest continue! There is little in rural life that is better or healthier.

I have mentioned that the Earl of Lauderdale was not fond of sport, and as there was a kind of unwritten law among factors that tenants were not to be allowed to shoot over their farms, hares were beginning to increase unduly. In answer to a specially drawn up request of the tenants for redress, the Earl wrote a letter allowing them to protect themselves against the hares by "keeping greyhounds."

Coursing is a better way of getting rid of hares than many people imagine, for though the hare has the best of it in six runs out of ten, the hard-run hare does not like to return to the same ground; so, those that are not killed get "run off" the farm.

The Marquess of Tweeddale followed suit and I received a letter allowing me to keep greyhounds. In my first lease the game was all preserved for the landlord although, as the tenant on a detached part of the estate, I had the verbal right to shoot what and when I liked, and on account of that I paid £50 additional rent.

Eventually regular "coursing days" became quite common on the larger farms; there might be as many as half a dozen of these days in the year. At that time I kept three or four greyhounds, and

generally had two "meetings" in the year at Boon. One of my dogs, blue in colour and called "Travancore," was very fast, and would have taken more prizes at public coursing meetings but that he was not quite "correct," and had run a little cunning at a preliminary trial; otherwise, probably he would never have become my property. When he became old he was the best "pot-hunter" in the country-side.

A friend and neighbour once had two young hounds, just out of their puppy stage, sent to him. They were despatched in a box by train from Dumfries, travelling by Carlisle and Hawick. A few days after their arrival at my friend's place they both disappeared and could not be heard of, though they were well advertised for. A hill farmer, who lived below the "Grey Mare's Tail" waterfall on the road between St Mary's Loch and Moffat, wrote to say that his shepherds had seen two dogs on the hill which answered to the description given in the advertisement. The dogs were caught later near Moffat. Were these young greyhounds trying to find their way home to Dumfries by the nearest route, or was it a mere coincidence that they took that road? Certainly they had never been on it before!

With the increasingly bad times greyhound coursing, as far as Lauderdale was concerned, died out in a few years, while village games and quoiting club meetings, etc., now so common and so much enjoyed, were, when carried on at all in those days, languid, lifeless functions, and in keeping with the general state of feeling in the whole rural community.

Shooting was a pastime to which one could resort at any time. Boon used to be a good farm for game

of all kinds, notably pheasants, hares, blackgame, and snipe, and as some of the neighbouring farmers also had the shooting on their farms, we had many a good day with our friends. Unfortunately, I was not a good "shot," and though I enjoyed the day's outing as much as anyone, was never credited with a big contribution to the bag.

I have, however, seen many wonderful exploits with the gun. Once, when out with a friend who was shooting rabbits, he peeped round the back of a whin hedge, then fired, and picked up five—a mother and four "half-waxed" youngsters. On another occasion, when walking up a very steep braeface among turnip drills, with another friend, he fired at a "flushed" partridge, and the keeper on picking up the bird found a hare also which had risen and was slinking up the hill, across the line of fire, just as the partridge was brought down! A partridge and a hare with one shot seemed a suitable thing to commemorate with a drink!

Again, when hares were plentiful, the extreme outside "gun" was seen to run forward and fire; he had got two hares in a line and, with one shot, killed them both! I saw this feat repeated a few years later at the beginning of a winter, by an old and noted poacher, as I was walking along a road. He had seen a hare lying and quickly got over the fence. Then he ran forward a little before firing, and, to my astonishment, lifted two hares. He returned to the road, and was putting the second hare into his bag as I came forward. Smiling, he slunk away. I had him up before the Sheriff at Duns for it, as a witness had heard the shot, and seen a man in the field whom I could identify. We

met, later, at the railway station on our way home, and I remarked:

"Jamie, ye dinna often shoot two o' them wi' one shot, do ye?"

He smiled, but said nothing for a few seconds, and then replied:

"Man, Doctor, I wasna there at a'!"

I have reason to believe that he paid his fine, expenses, and whatever else there was, "off Boon" during the next fortnight! I had a game-keeper for some time, and "Jamie" thought that it was therefore quite fair that he himself should try his chance occasionally. I honestly think that when a farmer had a shooting and there was no keeper, Jamie did not trouble that farm—much! There may be a certain amount of honour among thieves!

Sometimes the rabbits on Boon formed quite a good asset, making up to £100 or more, a year, but when this was the case then other things were bound to suffer. If the lessee of the rabbit shooting gave as much as that in a year it was pretty certain that he was "getting more than rabbits." By a special clause in the last lease I had the game-shooting on the farm as my own by lease, and as most of my sons were away from home I sublet it, getting, sometimes, quite a good rent.

That good feeling and sense of justice which a game tenant felt himself bound to respect and, acting in a sportsmanlike fashion, not to overdo his privileges, was greatly weakened during the War when a different "class" came into existence. The prices of everything got so high that even the old class seemed to lose their sense of proportion. "Let" shootings were overshot, and game became

depleted to such an extent that it will take many years to recover. It is true that two very bad seasons in succession as to weather contributed to this state of things ; while the shortage of keepers—all the younger ones going to the War—resulted in such an increase of vermin of all kinds, that any renovating process, which might naturally be expected, will be still further retarded. Smallholders and occupying tenant-farmer owners are very much against the natural increase of game in any district, so that the remedy has still to be found. The occupier, whether owner or otherwise, is not, even when willing, in a position to take any means to encourage the game, while the days of the old landlords are over and few men can afford the money required.

CHAPTER XVIII

AUTOBIOGRAPHICAL RECORD AND INCIDENTS

I HAD not intended to include the above in this book, but it has been represented to me that there are a good many things of interest which, as they are only partly agricultural, may be collected into a chapter bearing the above title. Many of them have, as they occurred from time to time, modified to a great extent the whole tenor of the history of my fifty years in Lauderdale.

A few years after entering the farm I became a Life Member of the Highland and Agricultural Society, and when it became known that I was willing to conduct experiments on Boon, I was asked to become a member of the Science Department, a Committee of the Society in which some of the members were not Directors. In this way I became intimate with Dr Andrew P. Aitken, the chemist of the Society at that time, and founded a friendship which gradually ripened as time went on and ended only with his death.

One November day, while walking with me after a meeting of the Department, he remarked :

“You should take out the Fellowship Diploma of the Highland and Agricultural Society . . . F.H.A.S. . . . Not that it would do you much good, but it would encourage other men to take it. It would

be a very easy matter for you with your Medical Diploma."

I replied that I would certainly do so, but I little knew at that time what I was going in for! During the winter session following I went occasionally, when in Edinburgh, to Professor Wilson's classes on Agriculture, and Aitken's lectures on Chemistry at the Dick College in Clyde Street, but only now and then looked in at Walley's Veterinary lectures. As I did not bother to do much work it was, when I came to think of it later, very foolhardy of me to go in for the examination in the following April. Although I had had a fair amount of experience previously of examination papers, one or two of those set by the examiners in that H. and A. Society examination rather took my breath away. The Mensuration man was a mathematician and gave a paper with distinct leanings that way; the Natural History paper was not nearly so much connected with agriculture as I had expected, and the Chemistry paper was also a stiff one. I made a mess of it, and when I told Aitken about it afterwards, all he said was: "You should have known!" I had, however, enough marks all over to give me the Diploma, which carried with it free Life Membership of the Society. A few weeks later I was much astonished to receive a cheque for five guineas from the Secretary of the Society, which thus repaid me for what I had expended some years earlier on my Life Membership.

In after years, I used to retail for the amusement of my co-directors of the Society, some of my experiences of that examination, especially the Natural History questions, such as: "the colour of

a small Coleoptera"—which I had never even heard of, or, the "shape of the condyles of a kangaroo's jaw," etc., or, the remark by Principal Williams of the New Veterinary College when, in answering his question, I described the "foetal circulation":—

"How do you know that?"

"I am a medical graduate," I replied.

"Where do you live?" and, when I told him, he said: "One of the best day's fishing I ever had was in the Leader and Boondreigh. Next time I am there I will come up and have a drink with you!"

I early became a member of the Berwickshire Naturalist Club, and have now been in it for forty years, with the honour of being appointed President of it for a year, fourteen years ago.

One of the first things I took up was medical service with the Volunteers of the day, being gazetted a Lieutenant of the Earlston Volunteer Company of the King's Own Scottish Borderers. As my time was my own it was recognised that I was the man to "stand in" on all occasions, and at shooting matches I was expected to be present or within call as accidents with firearms are always possible. When a Volunteer Company provided a medical officer the Government grant, to which it was entitled, was correspondingly increased, so it was quite a good thing for the Earlston Company that I should fill the post. Years afterwards, on being presented with the Long Service Badge, I was asked to allow my name to remain, with the rank of Lieutenant-Colonel. When, however, the real "push" of 1914 came, I am afraid I could not claim to be of much use, and so was retired in 1915.

In 1889 I was elected a member of the first

County Council of Berwickshire, and so remained until I had to resign prior to my appointment as County Medical Officer.

The first meeting of the County Council was held at Greenlaw, in the fine old hall built by the Lairds of Marchmont, on a winter morning with some very wild snow showers. There was a great deal of business to be done, as the bringing into force of the various enactments of the Local Government Acts was not an easy matter, and took a considerable time. During the day the weather went from bad to worse, and by afternoon the roads were blocked with the wild, drifted snow. Trains were snowed up, bakers' and grocers' vans, rural postmen, tradesmen, and others were caught in the storm, so that any attempt by the members of the Council to get to their respective homes was useless, and we were nearly all forced to put up for the night at Greenlaw. It was an unusual undertaking for the inhabitants to have to put up forty additional gentlemen, on account both of provisions and accommodation. I shared a room in a private house with a fellow Councillor who, though he slept well, snored loudly! By the next afternoon the trains were again running and roads were being opened up, and all our troubles were soon forgotten.

During the time that I was a County Councillor the county town was changed, and Duns was substituted for Greenlaw. This change was the result of a movement on the part of the legal faculty in the county and the authorities of the town of Duns, aided by the inconvenience of trains on the part of the railway company. It began by a motion being carried to hold every second meeting of the County

Council at Duns, and not very long after a second motion was made for the transfer there of the whole of the county business. Thus Greenlaw ceased to be our county town.

Soon after the change was made, a High School for the county was instituted, and in this I became much interested. As, at that time, Secondary Education could be had only in one or two private schools, or in public elementary schools where there were Secondary Departments, a school such as was contemplated seemed as if it would be of great benefit to the county.

In June 1891 I was appointed a Justice of the Peace for the County of Berwick. It was a high honour at that time. There were very few tenant-farmers who were Justices, and few of any station other than those who had a "real estate" interest in the county.

I have also felt it a great honour to have been asked to act as a Representative for the Border District on the Board of Directors of the Highland and Agricultural Society for twenty-eight years, and at one time to be a Vice-President. During all that time I took an active interest in the work of the Board, and was, in the main, in agreement with the general policy of the Society.

Some of the experimental work on Boon, which was carried out mainly in connection with the Society, is referred to in the Appendix, in the form of various Reports and Articles.

As I had passed various examinations myself it evidently occurred to others that I was a suitable person to put on as an Examiner! Accordingly, I was asked to become an Examiner in Agriculture

of College Diploma students of the Edinburgh and East of Scotland Agricultural College. I also served for a time as Examiner for the B.Sc. Degree in Agriculture at Edinburgh University; and was, for four years, under the Joint Board of the Royal Agricultural Society, and the Highland and Agricultural Society for the National Diploma in Agriculture (N.D.A.), whose examinations were held annually at Leeds. In this way I got most effectively into touch with the best of the young agriculturists during the prosecution of their studies, and was able from association with them and my fellow-examiners, to keep up my own agricultural knowledge, and to have my farming outlook kept clear and up-to-date.

Since the days of the old Rural Economy Classes in Edinburgh we have developed a good deal, but there is still much to do, all practically ready to hand. There are few more agreeable and honourable posts in the agricultural life of Scotland than a Directorship of the old Society, or a Governorship of one of the Agricultural Colleges, and not many have had, in that way, similar happy experiences to mine.

The Great War interfered with the carrying out of many suggestions for the good of agriculture, and caused one to think and act more in a national than a personal way. I had to take part, along with those who were no longer of use for actual military service, in the work that was waiting, such as by assisting recruiting and by taking part in the tribunals inaugurated under the Compulsory Service Scheme. I found that to be on a tribunal was not the pleasantest of work where one has to act contrary to the interests of those being "tried."

Where duty and justice had to be considered there was no room for partiality.

Another more or less difficult matter during the War was the work of the District Agricultural Committees. These were asked to arrange for a great increase in the cereal cropping of the country, so as to neutralise the attempt of the enemy to starve us by interfering with the shipping of grain and meat from America.

The organiser for the West District of Berwickshire and the committee of farmers who took the matter up most thoroughly were able to get a most gratifying increase in the grain crop from a somewhat unpromising country. The average height of the arable land of the district, including even a Tweedside parish, is over 600 feet above sea-level, but a special effort at a special time produced a very special result, of which we were very proud. It showed the patriotism of the farmers of the district in much the same way as the War Savings Committees—with which we were intimately connected—did by the big investments in Government Bonds.

Now that the time has passed for taking a part in the various offices and positions of the parish and district there still remains a satisfaction in the feeling that a due share of all such local work has been undertaken in the past, that the time required for it has always been willingly granted, and there is the additional knowledge that the kindness and abundant confidence of friends and neighbours over a considerable extent of country have shown that it has been recognised and appreciated.

When the Local Government Act of 1889 came into operation there were no applicants ready for

certain appointments that fell to be made. For these, special arrangements, in accordance with local conditions, were allowed temporarily under the Act. Such were, for example, the County and District Medical Officers. The appointment of Medical Officers now became compulsory, and those who were so appointed had to be registered medical practitioners. The Act stated that: "after 1st January 1893 (*i.e.*, three years after it came into force) no one shall be appointed a Medical Officer for a County, or District, or Parish of 30,000 inhabitants or upwards, unless he is so qualified, and also is registered on the Medical Register as the holder of a Diploma in Sanitary Science, Public Health, or State Medicine under Section 21 of the Medical Act 1886."

Taking advantage of the special arrangements the Berwick County Council, in order to meet the temporary lack of medical officers at the bringing in of the Act, appointed most of the local medical practitioners to the various county, district, and parish posts which, it was considered, should be filled. As there was not in the county any medical man who held a Diploma in Sanitary Science, Public Health, or State Science, that requirement of the Regulations was ignored for the time. The first County Medical Officer served for seven or eight years, but after his death a new condition of matters was found to exist, and no new appointment could be made which did not meet the requirement of the Act as to the holding of the above-mentioned diplomas.

There was also the provision that the new officer must not hold any other appointment, or engage in

private practice without the express written consent of the Council. By vote of the County Council the post was advertised at the late M.O.H.'s salary, viz. : £105, but no one applied in answer to it.

At this time I was the only registered medical practitioner in the county not engaged in regular practice, and as far as that was concerned the only one who had the necessary time at his disposal. Accordingly, I was asked if I would take the post. When considering the matter I found that two conditions would have to be agreed to before going any further. The first was that as I "could hold no place of profit while a County Councillor, and for six months after," I would have to retire at once from my position in that capacity. The second was that I would have to ask for the postponement of any appointment for at least six months until I could qualify for it by the taking of a Diploma in Public Health. The Public Health Committee mutually agreed with me as to these conditions.

Taking rooms in Edinburgh, I went in for Public Health classes in the University *at 50 years of age!* As, up to this time, I had not been specially keeping up my medical knowledge, everything felt distinctly hazy, most matters being partially forgotten, while not a few were entirely new to me in the past twenty-five years. At no period in my former studies had I to work so hard as during that winter, and periodical attacks of nervousness came upon me such as any student barely out of his "teens" might have had.

No one could have been kinder or more considerate than the Professor of Public Health and his assistant, nor more cheerful and helpful than

the Professor of Forensic Medicine of the time in his numerous calls to see how I was progressing. His jocular manner was a great advantage to a disheartened student, and we had many a good laugh when discussing the weight of a leg of lamb, or a brace of pheasants (which would be needed before I could get my diploma!); or, when the only correction he made in a report on an insanitary dwelling-house was a big, blue mark—a common word having been misspelt; or, at the slaughter-house, when he pretended to refer some special point in live stock management to me as a farmer, and my opinion on the carcass of a goat was of particular interest to him.

At length the examination came on, with questions on some points in Organic Chemistry from my old friend Professor Crum Brown. At my stumbling answers he merely smiled pleasantly. But with such subjects as Epidemiology and Endemiology, or questions on Leprosy—put as the result of a scare in Fife from the only case which had occurred for nearly half a century—I got excitedly nervous, and when, out of about eight students, I was the last that was called up, I felt sure I had been “ploughed.” Fortunately my old friend the Dean of Faculty had not given up his jokes. After some preliminary remarks such as that I “might have done better if I had been younger,” but that if I “would promise to read carefully some works” which he recommended, including one of his own later publications, he told me that he and his fellow-examiners had agreed to let me pass, and thereupon wished me “good luck as the County Medical Officer of Berwickshire!”

About thirteen years ago, only a short time before

I would have been retired under the age limit, I was asked to take the additional post of inspecting school children of the county; but as I was then 60 years of age I refused, and as retention of the Medical Officership would have placed me in an anomalous position, I gave all of it up, and was retired on a pension of £25 a year!

CHAPTER XIX

SOCIAL CONDITIONS

THE social conditions generally in Lauderdale in the '60s and '70s were as good as anyone in the farming class could desire. As was common all over the country at that time there was, perhaps, a little unnecessary sympathy with the over-indulgent, and I am not to be understood as in any way excusing the drinking habits of those days; I have seen too much of its effects for that. They certainly helped in some small measure to keep us more social and friendly in the '70s than in the dull and dreary '90s, when nobody had money to spend on drink more than on anything else.

During my time at Boon, out of eight adjoining farms five of the tenants have in some way met a violent death through drink. One made a most happy recovery abroad, and another equally so at home. While I admit that the district was certainly not a temperance preserve, the censorship on the occasional exceeeder was never very strict anywhere, outside the "unca-guid"; often it was a state which was intended and looked forward to, and in many ways was considered meritorious. Habits changed though slowly, mostly no doubt from the scarcity of money as the barer times came on, the worse succeeding the bad as the years passed. Anyway, as an

old shepherd said, it was: "Aye the langer the nae better." Later, it came to be that there was no need for the farmer to "have the hare or pheasant arranged for," which was to be a peace-offering to his wife when he got home timorously and shakily after a somewhat convivial evening, for such "evenings" became few and far between.

Among the kinds of entertainments in the district there were tea and supper parties for music, whist, and dancing in each other's houses, with shooting parties, at which there was lunch in the field and often dinner in the kitchen for the beaters besides that in the dining-room for the guests, as soon as possible after dark and a quick change could be effected. The earlier the dinner the more time there was for toddy, whisky, hot water and sugar, in which the ladies joined, and after that there were cards.

Dances in one another's houses were very common for many years, and a week seldom passed without a private dance somewhere to which my wife and I were invited. For the semi-public function, to save the turning up of the household entailed by the private farmhouse dance, a public hall was hired in a hotel or elsewhere, and as time went on this became much the commoner form, merging eventually into the public ballroom and public ball. The older people, however, missed the homeliness and more intimate nature of the private house dance.

The annual "Kirn" or Harvest Home Dance, mostly for the farm-servants, was another regular function at Boon, and combined with it were a big tea and Christmas tree. My wife had a large class

of girls in the Girls' Friendly Society as well as her Sunday School, so the tree was laden with books and presents for these, and with toys, useful things, and edibles for the children of all ages. There was also assembled my class of semi-scientific devotees, which I used to conduct in the smoking-room during the winter months.

At this class I used to show them various objects under the microscope, make chemical experiments, and tell generally the why and wherefore of their day's work, etc., etc. Sometimes I found, however, that I could not make it interesting enough, for in quarter of an hour half of them would be asleep. Most people would have found it difficult to keep these men awake in a comfortable room, in comfortable chairs, between seven and eight o'clock on a winter's evening, *whatever* there was to tell them. So, eventually, my part in this work was given up.

When all the gifts on the Christmas tree had been presented it was removed, the floor was swept, and dancing to one or two engaged fiddlers was begun. The large granary made an excellent dancing hall, and with lavish decorations the scene was a very gay one. With the help of many friends from Lauder and the neighbouring farms dancing was kept up till three or four o'clock in the morning. I can remember some forty-six "Kirns" being held in my time at Boon. The dances were what we called "country" dances—but this, I think, should be spelt "contre"—such as the Triumph, the Flowers o' Edinburgh, Highland Laddie, Petronella, etc., as well as the usual "round" and "figure" dances, such as polkas and schottisches, reels and strathspeys of all kinds.

Another social function of the early times was the *Ploughing Day*. As I had a lot of farm work of a more or less unusual kind to do, such as carting drain tiles, lime, fencing material, etc., there was a risk of the ordinary farm ploughing falling behind, and I asked my neighbours to help me by giving me "a day's ploughing." The day fixed turned out to be a fine autumn one, and as work generally was far forward it was a great success—134 ploughs were forward and about 140 acres were ploughed—and was one of the largest functions of its kind that had ever been held in the high district. Later, these "complimentary ploughings" fell into disuse more or less. Then agricultural societies took the matter up and the "ploughing day" became an annual "ploughing match" with a competition for prizes. For a long time, however, there were farmers who were willing to give their fields, and their own time and attention as well as the holiday for their people. It was not much of a holiday for the competitors, as the various prizes were very keenly contested, such as that for the "oldest" and "youngest" ploughman, the "man with the largest family," the "best cleaned horses," the "best kept harness," etc., etc. As Boon was, in many ways, a suitable farm, many of these matches were held there.

The social life of the Valley has been modified to a large extent by the financial position of the farmers. In 1872 almost all, though not by any means wealthy, were "well-to-do," and had been farming in times of rising markets. One farmer, who had been a land improver in his young days and had a large farm, admitted having done well during the first twenty-one years, which finished

about 1878, but could make nothing during the next twenty-one.

In the early days the clergy of the various parishes were held in considerable respect, and as a rule attendance at church was much more recognised as being the proper thing to be done by everyone than it is now. In Legerwood there would be six or seven farmers out of the nine in the parish, at church every Sunday. A stable at the manse was specially recognised as being for the use of the parishioners.

The former minister, Mr Brown, who baptised most of my family, was there for many years, and had some ways which were quite peculiar to himself. One of them was that he always wore black kid gloves in the pulpit during his services on Sunday. It is reported—I do not know with what truth—that on one occasion the great Dr Mair, his neighbour, interrupted his discourse with the remark: "Man, take off your mittens."

The Parish Minister of Gordon, then an elderly man and now long since dead, was a very good botanist and also a member of the Berwickshire Naturalist Club, in the proceedings of which he took an active part. He was a great favourite in his parish and was a keen humorist.

One very warm Sunday I had walked over to Legerwood Church, which I often did. The minister of Gordon was officiating and had successfully got over all the preliminaries and was well on with his sermon when he noticed that the heat had overpowered a large proportion of the congregation. Stopping for a second or two he then astonished us all by saying: "I'll give you a conundrum,

and I'll tell you the answer at the end of the sermon!"

"There was a man made a thing;
The man that made it did it bring;
The man it was for did not know
Whether it was a thing or no'."

Of course everyone was well awake by this time trying to guess the conundrum. At the close of the sermon he made some remarks on the uncertainty of life and the necessity of preparing for death, and then told us that the answer was "A Coffin." On another occasion when he was preaching in a neighbouring church he made a mistake in repeating the Lord's Prayer, and thought it such a bad thing to have done that he made the following apology to the congregation: "My friends, it is very easy to make a mistake like that when you are saying over a thing without thinking."

Another neighbouring parish clergyman was also a character in his way, and I came into contact with him soon after entering Boon.

A cousin of my mother's—a Mr Walter Stewart—was a lawyer in Pollokshaws near Glasgow, and in the summer of 1872 decided to pay me a visit, and at the same time to renew his acquaintance with the old parish minister of Westruther. Accordingly, on the first Sunday of his visit, he and I drove over about five miles to the church, and as I had a new trap and a good-going mare we were not long on the way. On arriving at the church we asked for a seat. Our appearance seemed to justify something special for we were shown into one of the few unused and cushioned pews, that of the principal heritor, Lord Blantyre. The service proceeded as usual,

except that the minister had meantime recognised my friend and seemed to have some difficulty in keeping from showing it. But as soon as ever he had said "Amen," he leant over the pulpit and, in the hearing of many of the congregation, called out: "Oh! Mr Walter Stewart, wait till I come down!" As I have mentioned, we were in the Blantyre seat, and the family name of the Master of Blantyre being Walter Stewart, quite a number of the people lined the pathway from the church, and touched their hats as we went out.

In many ways this old minister was somewhat unique both as a parson and as an individual. He considered the quotation: "Mercy and Truth kissed each other" much too broad, and paraphrased it: "Mercy and Truth entered into the most endearing and interesting relationships."

His glebe was fairly large, making up in quantity what it lacked in quality, but the various crops took some working, part of which, such as hoeing, he did himself. The potato patch of the glebe was quite near the manse, and one day, seeing Lady John Scott of Spottiswoode driving up, he bethought himself of the expedient—as he was in his oldest working clothes, and really rather disreputable-looking—of passing himself off as a scarecrow. So, turning his back he bent down as low as he could, held up his hands as high as he could, and remained stationary. My Lady had, however, recognised him, and when she arrived called him to come to her, doubtless enjoying the discomfiture of the minister in her own way.

As the seasons came round for the various farming operations he used to write to his numerous farming parishioners asking for help for the working

of the glebe. He would ask one or two to send ploughs, another harrows, etc., *along with the seed and other necessities*, until all his work was completed, the harvest eventually undertaken, and the crop secured.

CHAPTER XX

THE SCOTTISH AGRICULTURAL COMMISSION IN COLONIAL AND FOREIGN COUNTRIES

DENMARK, having made as great a recovery as could be looked for after being held down, quarrelled over, and robbed by her larger neighbours, that recovery had occasioned an interested inquiry as to how it had been done. This was especially the case as far as land tenure was concerned, and the apportionment of the soil amongst the people. If Denmark could make money, as a nation, out of small holdings, why could not others? To see what had been done, how it had been done, and to verify the favourable reports which had been circulated about it, arrangements were made for a number of farmers from various parts of Scotland to visit Denmark, and to report on the conditions existing there, and also as to the prospect of instituting similar conditions elsewhere. The Commission of Scottish Farmers thus formed had a splendid tour in Denmark, being fêted and shown round the country. All the information they desired was submitted to them, and on returning home a very full, favourable, and congratulatory report was issued in praise of the Government, the people, the farms and methods of farming. It was also recommended, in a general way, that "we should go and do likewise." In many ways the Danish case

doubtless helped greatly to encourage the subsequent small-holding legislation which then found so much favour in Government quarters.

The object of the originators of the Agricultural Commission to Denmark having been secured, the Irish Question was the next most urgent one to investigate. As it was so largely an agricultural project, a similar Farmers' Commission (of which I was asked to become a member) was organised, two years after the Danish one, to proceed to Ireland to report on what was to be seen, and as to the strength of the different views held by the opposing political parties. In the words of the Commission's Introduction to the Irish Report: "We went to Ireland to see in the *revival* of agriculture, just begun there, the causes at work which, in Denmark, had ended in unparalleled success." It is unnecessary to discuss to what extent this "revival of agriculture" was a lasting one, though the methods of Sir Horace Plunket, with R. A. Anderson and James Wood as helpers, seemed at the time deserving of success.

We started from Dublin on 25th June 1906. The thirty-three members of the Commission were divided into two parties, one forming the northern section and the other the southern. An excellent itinerary was made up for both sections. The weather was, on the whole, fine, and with most agreeable company a very pleasant time was spent. The Report published when the visit was finished makes, in the light of future happenings, rather unusual reading in some parts of it, and shows some of the conclusions then arrived at to have been of rather too sanguine a nature.

The idea that an Agricultural Commission should

visit other lands and report seemed now to have "caught on." In 1908 an invitation was received from the Dominion of Canada to spend six weeks of August and September in investigating the various provinces forming that Dominion. It was felt that distinct benefit to the Home Country would ensue if the farmers who had reported on Denmark and Ireland could give their approval to the various schemes for immigration suggested by the Dominion. They might also advise their adoption by agricultural labourers and domestic hands, and those at home be helped by means of a favourable report which would be published, similar to the Danish one.

This projected visit of the Commission demanded, however, from its members more than either of the two preceding ones had done. An absence from home of two months at harvest time reduced the number of those who could go, but on the 13th of August 1908, twenty-two of us landed at Rimouski on the River St Lawrence, where the Canadian Pacific liners discharge their mail bags. The journey turned out to be a tour, and all the provinces of Canada were visited except Newfoundland.

We started from Rimouski in a private Pullman saloon and sleeping compartments, and in charge of a specially appointed staff. During the night the train passed across the Gaspé Peninsula, and through the northern part of New Brunswick. When we awoke early next morning the view from the car windows was enchanting. Before us lay an extensive bay of clear, placid water with a wooded coast; a small town lying beside its diminutive pier; the houses and gardens full of colour, and all reflected in the water; while, by the pier, lay a coasting

steamer, pure white, the only colours about it being its red funnel and the Union Jack. The whole picture of this part of Point du Chene on Shediac Harbour, as seen that summer morning, remains clearly in my memory. From the specimen given us of dinner on the preceding evening and breakfast the following morning in the Pullman saloon, it was clearly indicated that our lines were being cast in pleasant places.

Beginning from that first morning we had a continuous trip of the most enjoyable description. First we went to Prince Edward Island across the Northumberland Strait, with its beautiful bays and harbours and its extensive cultivation; then, to Nova Scotia with its memories of Grand Pré and Evangeline; to Halifax with its harbour, and thence on again to New Brunswick and the St John's River, where there is the enormous tidal movement in the Bay of Fundy.

Our saloons were not run on "Prohibitionist" lines, so, when we entered the State of Maine on our journey to Montreal, we had to travel by night and submit to be "sealed up" for the time by the excise officers.

The only drawback to this whole tour was that there was too much to be seen and too little time in which to see it. As was natural in the circumstances, the large cities of Montreal, Quebec, Toronto, and Ottawa suffered most neglect. The purely agricultural towns and areas were the places we were out to prospect, and more particularly those objects which were strange to us. There was such an immense area to be covered from east to west, from the Atlantic to the Pacific, from Quebec to Vancouver, that only the most important parts could

be inspected, and only from an agricultural point of view. Every part visited was, however, deeply interesting. The great Lakes, Niagara, the woodlands and rocks to the north, the Prairie Provinces, the Rockies, British Columbia, and the extensive lands of the West, all had to be realised as a great country with its many and various conditions of labour and commerce, some in the making, some made, but all parts of one big whole. The ultimate result of our visit to Canada was a readable and well-illustrated Report which was published by the Dominion Government, and in the compilation of which most of us took our part.

A further venture, and what proved to be the greatest of all the voyages of discovery of the Scottish Agricultural Commission, was reserved for 1910, in response to an invitation from the Commonwealth of Australia that it should receive a visit on somewhat similar conditions to that paid to the Dominion of Canada. Again I had the honour of being asked to join the party. This time the number of members was still further curtailed; only twelve could arrange to join the Commission as the absence from home would be quite *six months*. The sea voyages to and fro occupied about ten weeks, and we were about seventeen weeks in all in Australia and Tasmania. A Report, dealing with most of the salient features of the pastoral, agricultural, mining, and industrial situations was published after we had got home again. It was, everything considered, a magnificent tour, splendidly organised and carried out, instructive and enjoyable in a marked degree.

We commenced in Queensland with the sheep

lands of the far west, the cattle-rearing of the north, the sugar-canes of the coastal Tropics, and the grain- and fruit-growing of the temperate regions. Thence we visited New South Wales, Victoria and Tasmania, where, among the other settlements and in more temperate climates, wool-growing forms often the chief industry, the Merino sheep, or crosses of them, reaching nearest to perfection. Lastly, the newer states of South and Western Australia were enjoyed, and here some exploring had to be done.

The experience of life under all the various phases of these "Excursions" to different parts of the world was what one would not willingly have missed. It has been most refreshing in the years that have passed since then to go over old Reports, recalling the circumstances in which they were written, or the particulars and incidents to which they refer; to remember the many kind friends who did so much to give us pleasure and profit in the various "New Lands" that we were invited to visit.

APPENDICES

I

NATURAL PASTURE-LANDS AND HOW THEY BECOME BOTANICALLY ALTERED BY AGE AND TREATMENT.*

By ROBERT SHIRRA GIBB, M.B., C.M., President.

I HAVE had great difficulty, because I am not a specialist in any of the subjects of most interest to you as naturalists, in finding a theme on which to address you shortly as your retiring President, and it is only after much consideration that I have taken the liberty of compiling a few notes which, if I may be permitted the somewhat slang expression, savour a little of "the shop." The subject of them may be briefly defined as "Natural pasture-lands, and how they become botanically altered by age and treatment." The subject might be otherwise designated—"Some points in practical Graminology"; but as I expect to mention other plants besides Grasses, that title might involve a "terminological inexactitude" which it would be better to avoid. When I began about thirty years ago to attend meetings of the Berwickshire Naturalists' Club, I had been for the preceding seven years engaged in that operation most abhorrent to the botanist, or at least to the plant-collector, the draining and bringing into cultivation of the bogs and moorlands of an extensive and high-lying farm; and at that time I had dreams of prosecuting Botany as a relaxation for which I had a strong liking when a student at the University of Aberdeen. The claims of agriculture during the financially trying times, however, and the pressure of engagements of a public nature, along with a solid amount of pure laziness, seem to have interfered with the realisation

* Being an Address to The Berwickshire Naturalist Club on 14th October 1909.

of these dreams, and I have only been able to turn my attention to the more utilitarian and practical side of that interesting science.

I yield to no one in my admiration of the beautiful in plants—their form and their flowers—or in the extraordinarily interesting expedients made use of for their self-preservation, or in the splendid variety of colour displayed in “the forest of tiniest pale green stems and leaves,” or in the more luxuriant fullness of the summer shades, or again in the russet hues of a peaceful decay—the fitting conclusion to the life spent in doing the work for which it was formed. But it has always appeared to me that there remains a distinct and very interesting branch of the subject of plant-distribution, in the consideration of how it is affected by various modes of treatment, natural or otherwise. In walking along a fence dividing a plantation from a pasture, we find a different herbage growing in the shade from that in the open. Even when the plants are not much overshadowed there is a difference on each side of the fence in their variety. Those that do not take kindly to the cropping of cattle and sheep are inconspicuous on the one side, but luxuriant on the other. On the other hand, those that grow best on consolidated soil are encouraged by the treading of the stock, but are restricted where the soil is looser. Those who have even casually examined a hill pasture must have noticed the difference in the herbage on the sheep walks from the rest of the pasture, due to this treading. One animal in particular alters the nature of the plant-life of most of the haunts of the plant-collector, namely the rabbit, which is most fastidious in its tastes, and owing to its breeding early in the year has the first bite in the opening spring. Early wild plants stand most in jeopardy. There are some plants that the rabbit does not care to touch. To the *Ranunculus*, *Geranium*, *Forget-me-not*, *Speedwell*, as well as *Thistles*, *Nettles*, and many of the order of *Compositæ*, they seem to have a special aversion, while they are proportionately partial to most of the *Cruciferae*, *Leguminosæ*, and *Gramineæ*. But there are other herbivorous members of the animal kingdom that

likewise have their favourite plants, and the comparative excess of any class of animal in any district has a very material effect on the distribution of its *flora*. That is a wide subject and somewhat outside the purport of this Address; but I was led to investigate it a little as the result of an inquiry as to whether according to common opinion rabbits on hill pasture-land poisoned the herbage; and I may here say that except in so far as excess of stocking by any animal tends to render land what is called "foul," I was unable to lay any special blame on the rabbit, and that, from the fact that the rabbit is very fastidious as to its food and has the first bite of the tender succulent herbage, the harm proceeded from no special cause to which the term "poisoning" could be given. Meanwhile I can conceive that it has a very great deal to do with regulating the *flora* of any district or area.

Over the many plants for the most part called natural, which go to effect changes in hill pastures, the farmer has little or no direct control beyond the first few years after seeding. The wind, birds, and other agencies, carry seeds from all sources, and a process of natural selection follows; hence in a few years the plants which occur correspond no longer to the mixture of seeds that were sown. The species which grow and thrive, though the fittest to survive in the particular environment, are not necessarily the most desirable. It is presumed this change takes place on all classes of soil, and experts are of opinion that on many the beneficial effects agriculturally of laying land down to permanent pasture cease to be cumulative after some years, owing to matted roots excluding air and crowding out more succulent and profitable elements of vegetation. I can, however, certify to the fact that under natural and unaided conditions on poor high soils, and even on many not naturally poor, the change becomes one of deterioration, and that within a few years sown Grasses and Clovers are replaced by more hardy but agriculturally less valuable Grasses and weeds. Wiry, harsh, unnutritious plants come to predominate, and Rushes, Mosses, and a long list of weeds usurp the place of the others. On my farm, lying about 850 feet above sea-level, a large area

of ground—some 800 acres—was ploughed up from moorland in the seventies, and as it was drained, and had a full allowance of lime and manures, and time given for the old turf being completely rotted, all old vegetation was destroyed. Later, it was sown down with a mixture of Grasses and Clovers—Rye-grass and White Clover mostly predominating. No Meadow, Sweet Vernal, Dog's-tail, or Bent Grasses were sown. From the first to the fourth year the seeded plants held their own though to a yearly decreasing extent. After that time Yorkshire Fog and Moor Bent gradually took their place, and by the sixth year occupied the whole area, along with Vernal and Brome Grasses, some Hard and Sheep's Fescue, and one or two others. The smaller Grasses along with the White Clover were practically smothered out. I have a note of a rough botanical analysis taken in 1886 of an eight-year-old field, namely, *Agrostis* 37 per cent.; *Anthoxanthum odoratum* 10 per cent.; *Poa pratensis* 4 per cent.; Meadow, Hard, and Sheep's Fescue 8 per cent.; Rye-grass 8 per cent.; White Clover 4 per cent.; common Sedges and Rushes 7 per cent.; Daisies 3 per cent.; and *Aira cæspitosa*, Dandelion, various Thistles, etc., making up the rest. It must seem somewhat remarkable that, after eight years, Rye-grass and White Clover should be the only two remaining of the seeds sown on a piece of ground in which the old sod had been completely rotted—and was therefore very rich in organic matter—and had been supplied with phosphoric acid and potash and lime in abundance. The changes of the succeeding ten years showed an increase of the *Agrostis* up to 70 per cent., the White Clover almost invisible, the *Poas* and smaller plants crowded out, Bull's-faces, Hard Fescue, Sweet Vernal, and a few Sedges and Rushes making the total herbage. After close search one weak plant of White Clover was found in about 10 square yards. The absence of Leguminous plants generally was particularly noticeable. Thus on the same ground the original heath in the first place becomes by treatment covered with the most scientific mixtures of Grasses and Clovers invented for the use of agriculturists by expert seedsmen, only in the course of a few years to be made

the battle-ground of a fight to the death of many strong growing Grasses and weeds, with the victory of some that are perhaps among the most useless for the adequate support of the highest forms of animal life.

As agriculturists we are in the habit of estimating the value of a pasture by the amount of stock it can carry per acre, and in my case, when its carrying power had become reduced to half its former value, some treatment seemed to be necessary. The radical treatment would have been to begin over again with the plough, etc., but with the more thorough knowledge of the manurial needs of arable lands, a series of experimental trials on worn-out pastures, as they have been called, was resorted to. It thus happened that the moorland, which had been broken up in the seventies and allowed gradually to deteriorate during the eighties and early nineties, came to receive some attention, and to be treated in various ways, the results being manifest in the botanical changes noticeable in these specimen sods to which I would draw your attention. There would be, it is natural to suppose, a considerable residuum of the original dressing of potash, lime, and phosphoric acid, and there is still excess of organic matter, though these may be in an unavailable form for the majority of the plants which go to form a good pasture, while quite available for the strong growing and strong rooted plants in possession. The question therefore came to be by what means could the nitrogen in excess in the organic matter be made available, and how could the excess of strong vegetation be checked? Without wearying you with the agricultural details of the treatment, I may say that in many cases this has been successfully carried out, and, as you may see, the character of the vegetation has been materially altered. Those of you who are more proficient in the details of the different plants will be able to correct me, where I am wrong; but what I have ascertained is that by the addition of a considerable quantity of phosphoric acid, which is the weak ingredient in moorland soils, by treading with sheep when the ground is soft, by eating down with cattle when the coarse Grasses are in their most succulent state, and especially

by using every means to encourage the spreading of the running sub-surface stems of White Clover, these results have been brought about, and the capacity for grazing nearly doubled in many cases, the improvement continuing for a considerable number of years. The remarkable feature is that no re-seeding has taken place, and that the weak White Clover plants of twenty years ago have spread till now they fill 60 per cent. of the area, while the stock render the determination of the other herbage most difficult owing to very few species being allowed to seed. I think there is no reason to suppose that otherwise than in the case of Clover the proportions of the herbage have materially altered, and a botanical analysis which has been made shows that though the White Clover may have gone up from 4 per cent. to over 50 per cent., the plants which form the residue are still there and in much the same proportions as formerly, namely, *Agrostis*, still largely in excess, Vernal, *Poas*, Sheep's and Hard Fescue and Rye-grass, Sedges, *Airas*, and Rushes having suffered badly, but Thistles and other *Compositæ* having held their own wonderfully well. The only Leguminous plant left in ten years is the White Clover. I admit the botanical analysis has been made by myself, and therefore has been done very roughly; but it is a point which the new Agricultural Research Commission, proposed under the Agricultural Development Schemes of the Government, might take up with the view of demonstrating why *Agrostis*, Vernal, Crested Dog's-tail, and even Yorkshire Fog become nourishing eatable grasses when grown alongside excess of White Clover, but remain worthless when growing alone or in their own company.

I am afraid you will think that I am inflicting on you a mere every-day agricultural lecture; but I felt I must address you on what I knew something about, even at the risk of proving tiresome on a subject in which you are not specially interested. If I may venture a little further, I would like to mention some points on pastures under different treatment, those conducted at that most interesting Research Station, founded and endowed by the late Sir John Bennett Lawes at Rothamsted, in Hertfordshire, where

a piece of old grass land was divided in 1856 into half-acre plots, and every year since each plot has been manured in a similar manner. The plots are cut for hay every year, and not only are the weights of hay recorded, but a portion of the herbage is sorted out into the Grasses, Clovers, and other plants of which it is made up. As stated in the various reports, the general results indicate that whatever the particular mixture of plants in a field may be, it represents the combined result of the soil, the manure, and the kind of management adopted, and when any of these items are altered the nature of the herbage is altered also. For example, if a field mainly Cock's-foot is hayed every year, the Cock's-foot diminishes; again, that excess of nitrogen will drive out the Clovers, though in the chemical analysis of Clover nitrogen is the prominent ingredient, whereas phosphoric acid and potash will encourage them, though only weakly represented in the chemical analysis. Though in general practice things are never carried to the extremes they are at Rothamsted, yet the plots there show the direction in which different manures tend to change grass lands. This Rothamsted old pasture land is known to have been lying untouched for at least some centuries, and at the beginning of the experiment in 1856 the herbage on all the 20 plots was apparently uniform. The soil all over the 7 acres experimented on was a stiff, reddish loam, the individual plots being from a half to one eighth of an acre, and, as has been said, being cut for hay every year since the experiment began; and, with the exception of two, all the plots have received manurial treatment of some kind, the manuring of most of them having been continued without change through all the intervening years. The herbage on this grass land comprises, besides numerous genera and species of the Gramineous and Leguminous families, representatives of some twenty other natural Orders in about fifty different species. "So complicated have been the manifestations of the struggle in plant-life that has been set up as the result of this treatment, that even after many—about fifty—years' work both in field and laboratory, many points of great general interest are still open to future

research." These experiments were originally taken up and arranged from an agricultural point of view, but to use the words of Lawes and Gilbert's report, this "investigation of the effects of different manures on the mixed herbage of grass land has led us far beyond the limits of a purely agricultural problem, and has afforded results of more interest to the botanist, the vegetable physiologist and the chemist, than to the farmer."

In one of the later reports of the Rothamsted grass experiments, Mr Hall, the Director, says:—"In dealing with the produce of grass land, which is a mixed herbage consisting of many different species of Grasses, Leguminous plants, and those of other Orders, it is not sufficient to consider only the gross weight of produce. There are such differences in the way in which plants respond to treatment of any kind owing to differences of habit and their relations to their environment, that the original equilibrium between the different contending species is disturbed. Some are favoured and increase at the expense of others, until a new equilibrium is attained, and the general character of the herbage from a botanical point of view is completely altered." A plot which had been unmanured in any way, but cut for hay every year since 1856, and which may be taken as typical of the whole area experimented upon, showed when the first botanical analysis was taken in 1862 the subjoined result, with which is compared a later analysis, taken in 1903, indicating the effect of over forty years' constant cutting (see table on opposite page).

Almost all the plants are perennial, very few annual, and the hay crop has been cut before many of them have been able to ripen seeds. Some of these differences are difficult to account for. The plants that naturally survive are those that seed themselves early and before cutting, as may be the case with Yorkshire Fog. Some of the stronger rooted plants may have died out during these years from their plant food being used up, and in the mild climate of Rothamsted some have the power of throwing up seed stems in the aftermath, accounting in all probability for the increase of Sheep's Fescue and Quaking Grass, as well

as of the Bird's-foot Trefoil and Meadow Vetchling. Some plants have the power of procuring plant food even under most adverse conditions, which may account for the increase in such plants as Burnet, Hawk-bit, and Knap-weed, which now form about 50 per cent. of the whole herbage.

	Per cent. in 1862.	Per cent. in 1908.
GRAMINEÆ—		
<i>Anthoxanthum odoratum</i>	4	1·5
<i>Alopecurus pratensis</i>	4·5	0·5
<i>Agrostis vulgaris</i>	11·5	0·2
<i>Holcus lanatus</i>	5	5
<i>Arrhenatherum avenaceum</i>	0·07	0·1
<i>Avena pubescens</i>	9·5	4·5
<i>" flavescens</i>	2·5	1
<i>Poa pratensis</i>	0·3	0·3
<i>" trivialis</i>	1·5	0·01
<i>Briza media</i>	2	20·25
<i>Dactylis glomerata</i>	1·75	1
<i>Festuca ovina</i>	13	17·5
<i>Lolium perenne</i>	6·5	0
Other species (<i>Bromus mollis</i> ; <i>Phleum pratense</i> ; <i>Aira cæspitosa</i> ; <i>Cynosurus cristatus</i> ; <i>Festuca pratensis</i> ; <i>Festuca elatior</i> , etc.)	0·25	0·25
LEGUMINOSÆ—		
<i>Trifolium repens</i>	0·5	0·15
<i>" pratense</i>	4·5	1·5
<i>Lotus corniculatus</i>	2	3·64
<i>Lathyrus pratensis</i>	1·3	2·5
OTHER PLANTS—		
<i>Ranunculus acris</i>	5	2
<i>" bulbosus</i>		
<i>" repens</i>		
<i>Poterium Sanguisorba</i>	0·01	13
<i>Conopodium denudatum</i>	1	1
<i>Centaurea nigra</i>	0·3	4
<i>Achillea Millefolium</i>	1·5	2·5
<i>Leontodon hispidus</i>	0·06	6
<i>Plantago lanceolata</i>	7·34	2
<i>Rumex Acetosa</i>	1·5	2·2
All other species	5	6·5

The effect of manuring with nitrogenous, phosphatic, and potassic manures, in various combinations, in addition to the annual cutting is more complex, and the changes as the years have gone on have been most interesting, and in many ways wonderful. The details of weighings and

botanical analyses taken yearly since the experiment began, are given fully in the voluminous reports of the Director and his staff. Only a very hurried glance at some of these changes can be attempted here. A marked difference in the herbage is found on the plots to which a full manuring of nitrogen, potash, and phosphoric acid has been applied. The source of the nitrogen, whether from sulphate of ammonia or nitrate of soda, has also produced differences of a peculiar kind. Generally this complete manuring, where sulphate of ammonia has been used, has caused an enormous increase of the smaller Grasses, especially *Poa pratensis*, *Festuca ovina*, and *Anthoxanthum odoratum*—the last named having gone up from 4 per cent. to 23 per cent. In fact these three Grasses form about 90 per cent. of the whole, and the absence of *Leguminosæ* and other plants is most marked. The weight of hay has gone down by 50 per cent., even though the manuring has been so extravagantly complete. The fact that the smaller Grasses have taken the place of the larger and more vigorous no doubt accounts for this. When nitrate of soda has been the source of nitrogen this change has not been so great, probably because Meadow Fox-tail and the Oat Grasses, and generally those rooting more deeply, are influenced earlier by the greater solubility of the nitrate. Where these nitrogenous manures have been applied alone, a marked difference in their action has been found. In the case of sulphate of ammonia Sheep's Fescue and Sweet Vernal have trebled their percentage. The Fox-tail, Oat Grasses, *Poas*, Rye-grass, etc., have absolutely disappeared, and hardly a trace of Leguminous plants remains. *Leontodon hispidus*, which had flourished with an addition of superphosphate to the extent of 14 per cent., has quite disappeared, while *Rumex Acetosa* has gone up from 2 per cent. to 17 per cent. Nitrate of soda alone has not proved quite so fatal to Leguminous plants, as a few weak specimens are found. The Sheep's Fescue has been crowded out by the Oat Grasses, and *Centaurea nigra* and *Plantago lanceolata* are found in abundance. The acid nature of soil treated with such persistent quantities of sulphate of

ammonia was exemplified by a small portion of the plot being supplied with a dressing of chalk, which resulted in the disappearance of the Sorrel which had increased by 15 per cent. With nitrate of soda a new plant had appeared and thriven, namely, *Anthriscus sylvestris* (Beaked Parsley), which first showed itself in this plot in 1867, but now occupies about 10 per cent. of the whole plot. Another notable feature is the large increase of Yorkshire Fog, which has gone up from 5 per cent. to 50 per cent. When potash and phosphoric acid have been applied without the nitrogenous manures, Leguminous plants have increased to 24 per cent., and, judging from the hay crop, have been sufficient to keep up the soil fertility. Where potash has been omitted and only phosphoric acid used, *Lathyrus pratensis* is specially abundant, but Clovers have diminished and consequently the general fertility, though *Lotus corniculatus* is still healthy.

I think I have said enough to show the extreme interest of these Rothamsted plots; and an examination of the results with a knowledge of the habits of the plants as to root, stems, leaves, tillering, partiality to shade or sunshine, requirements as to soil, moisture, etc., gives in many cases, though not in all, a key by which the causes of the changes may be arrived at. It would almost seem as if a plant with the power of taking a natural supply of a manurial ingredient easily, resented the application of an artificial supply.

I have to thank you for your kind attention to the remarks I have made on a subject which certainly could not be interesting to all, and I would like, in closing, to acknowledge the full use of information supplied by Mr Hall, and extracted from the published reports of the Rothamsted Experiment Station.

II

FARM MANURE: WHEN SHOULD IT BE APPLIED IN A ROTATION?

By R. SHIRRA GIBB, Boon.

See *Transactions, Highland and Agricultural Society of Scotland*, vol. xv. (1903) pp. 221-232.

III

IMPROVEMENT OF HILL-PASTURE AS DETER- MINED BY THE EFFECTS ON STOCK— EXPERIMENTS IN SCOTLAND.*

By DAVID WILSON, D.Sc., of Carbeth, Killearn.

THESE experiments were begun in 1901 by the Highland and Agricultural Society and the West of Scotland Agricultural College, with the co-operation of the Board of Agriculture, and it has been thought desirable that a report of the results for the first four years should now be published.

The method of these experiments is essentially the same as that adopted at the Northumberland County Demonstration Farm of Cockle Park. Dr Somerville, who initiated the well-known experiment in the Tree Field there, published a paper in the *Transactions* for 1900 (p. 75), in which he describes the rationale of that experiment, and the results for the first three years. It will be sufficient here to say that plots variously treated were grazed by sheep during each summer, and the increase in the live-weight of the sheep was taken as the measure of the effect of the treatment. As is well known, the results have been wonderful. Almost all the treated plots showed a handsome profit, amounting, on a plot to which 10 cwt. of basic slag was applied in 1897, to a

* See *Transactions, Highland and Agricultural Society of Scotland*, vol. xvii. (1905), pp. 271-295. Extracts applicable to Boon.

net profit estimated at 25s. per acre for every year since, and this upon land valued at 5s. per acre. When the Board of Agriculture suggested that trials of a similar kind might be made in Scotland, and that under certain conditions they would give a grant towards meeting the cost, the Directors of the Highland and Agricultural Society and the Governors of the West College heartily agreed to the suggestion, and accepted the offer. Not that they anticipated such marked results as at Cockle Park, but they were anxious to co-operate with the Board on the basis of joint management and payment; and they recognised that there was a very large area of pastures in Scotland which gave unremunerative returns for grazing, and that some outlay was justified in determining, as nearly as field-experiments could, the profit or loss following the application of manures to such pastures. For this purpose the somewhat troublesome and expensive method adopted seemed to be the only one on which any reliance could be placed; for it is the quality, quite as much as the quantity of the produce, that has to be measured. Even the quantity cannot be tested by cutting and weighing, as a field regularly hayed soon ceases to be comparable with a pasture.

As the lessons from field-experiments are more or less of local application, and the confidence in such trials largely depends on the results being confirmed by repetition, it was decided to have as many experiments as possible and spread them over different districts. To effect this, each experiment consisted of five plots only, whereas, at Cockle Park, there were originally ten plots for grazing, of 3 acres each. It was further arranged that, if possible, the plots in Scotland should contain 4 acres each.

The Highland and Agricultural Society were fortunate in getting the use of three fields in the east of Scotland, at Sunderland Hall in Selkirkshire, Boon in Lauderdale, and Naemoor in South Perthshire, which as nearly as possible fulfilled the conditions desired for this experiment. These conditions were that each field should contain at least 20 acres, capable of being fenced off into five plots of fairly equal character as regards soil, shelter, and herbage; that

the ground had been some time in pasture which showed abundant room for improvement; and finally, that each station should be in a different part of the country, and be typical of a large area of grazing land that might be similarly treated. Every effort was made to get an experimental field in a more northern county, but no land fulfilling these conditions could be obtained. The West of Scotland Agricultural College was successful in obtaining four stations that fairly represented their district, and fulfilled, as well as could be expected, the above conditions—viz., Holystone in Dumfriesshire, Hillridge in Lanarkshire, Boreland in Kirkcudbrightshire, and Auchnaskeoch in Argyllshire. The land at disposal in the two latter places made it necessary to reduce the size of the plots to 3 acres each, but an arrangement which thus enabled the College to include an additional district more than compensated for this curtailment.

The proprietors and farmers from whom these seven fields were obtained have throughout shown the utmost interest in the work, and have been most careful in carrying out every detail. In every case they were assisted by a local committee of farmers and skilled stockmen, who helped to select the sheep for each plot, attended the monthly weighings, and, as the experiments progressed, gave great assistance by their practical skill and judgment in deciding from time to time the number of sheep that could be most profitably carried by each plot.

Though the dividing fences were arranged so as to make the five plots as equal in character as the confirmation of the ground would allow, it was recognised at most of the stations that there was some variation in the land or herbage that might cause sheep to do a little better on some plots than on others. It was felt that there would be much reason for regret if results, laboriously obtained during a series of years, should be vitiated in this way, and it was therefore arranged that no manures should be applied the first season (1901), and that that season should be devoted to testing the equality of the plots.

Except at Boon, the same number of sheep were placed on each plot and weighed monthly till the end of the

grazing season. The result showed, as was anticipated, some variation in the increase in live-weight obtained from the various plots, and fully justified this preliminary test. It indicated for future years the limit of correction that might be made for inequality of plots.

The treatment of the plots was the same for all the experiments, and is stated in detail in the tables given in this report. The manures on Plots B, C, and D were applied in February 1902, an interval being allowed to elapse between the application of the superphosphate and the ground lime to Plot D.

In giving cake to the sheep on Plot A, the object was not so much to determine whether the extra feeding would give a profitable result in itself, but rather to test whether it was more economical to manure such pastures directly or through the sheep. A mixture of decorticated and undecorticated cotton-cake, half and half, was chosen as a suitable food, giving a valuable manurial residue in proportion to its cost. The cakes were regularly analysed, and the mixture, with little variation, contained 5.3 per cent. of nitrogen and 2 per cent. of phosphoric acid.

In deciding the manures to be applied to Plots B, C, and D, the main object was to encourage clovers, and ultimately enrich the land by the nitrogen they collect from the atmosphere, and so put it into a condition capable of supporting more productive and nourishing grasses. Basic slag (10 cwt. per acre), and basic slag along with potash were at once selected for two of the plots. The former had given the wonderful result at Cockle Park, and while potash had not been found so necessary there, it might well prove a requisite constituent for the encouragement of clovers on lighter or more moorish soil. There was more difficulty in deciding what manure should be applied to the remaining plot. The choice lay between fine bone-meal and superphosphate along with ground lime. The joint-committee ultimately decided on the latter, mainly because that, next to slag, this combination had proved the most profitable at Cockle Park, and the plot dressed with it there was showing several features of special interest. It

was felt that a direct supply of quickly acting nitrogenous manures, such as nitrate of soda or sulphate of ammonia, which would require to be frequently repeated, was not a practical method of permanently improving such pastures, and the plot at Cockle Park which got sulphate of ammonia in alternate years had proved, next to a heavy dressing of lime, the least profitable of any.

On the whole, the sheep on these plots have remained healthy and thriven well. It was feared that by confining enough sheep to keep down the grass to plots of 4 acres for the whole grazing season the pasture would become foul, and the sheep would not increase in weight nearly so rapidly as if they had a larger run or an occasional change. Except during one season on a plot or two at Boon and Holestane, this has not proved to be the case. On the contrary, the local committees of practical men have generally been surprised at the number of sheep carried on these 4-acre plots, and the increase in weight they have made. When the experiment began movable fences were provided by which a portion of each plot could be spared for a time, and a change given to clean ground. In the east country experiments it was seldom found necessary to resort to this plan, but in all the experiments under the charge of the West of Scotland College the plots were divided by these fences into two equal parts, and as a rule the sheep were grazed alternate weeks on each of these half-plots. In some cases the reserve sheep, which had practically unlimited grazing room, were weighed monthly along with those on the plots, and their increase in live-weight did not materially exceed that of the sheep on the unmanured plot.

Before noticing the main features presented by the seven experiments separately, a few explanations may be given that apply equally to all the tables of results (I. to VII.).* In all these tables the results for the years 1901, 1902, 1903, and 1904 are given in three different forms. The last four columns compare the "carrying power" of the plots. On all the experiments it was found that the treated plots would carry more stock than Plot O, which got no treatment. The

* For other Tables than Boon, see *Transactions*.

figures given might have been number of sheep per acre, but as sheep were added or removed from month to month, this would have involved curious "fractions" of a sheep. Moreover, in the different experiments the sheep were of different breeds and weights, and the mean live-weight per acre seemed the best method of comparison. Where the number of sheep remained the same during the season, the "mean live-weight" is the average of the live-weight of the sheep when put on the plot and when taken off it. When sheep were added or removed this has been allowed for, by evident methods, so that the numbers given show accurately the average live-weight per acre during the whole time of grazing. As will be seen later, the interest in those figures arises mainly from the fact that the effect of treatment has generally been more marked in increasing the carrying power of the pastures than in improving their feeding quality.

These figures, of course, depend upon the judgment of the practical men on the local committees, who put on each plot the number of sheep they thought it could fairly sustain, and, as it is difficult for men even of the greatest skill and experience to stock so that an *anticipated* amount of herbage may be utilised to the greatest advantage, it is not claimed that these figures lend themselves to fine distinctions. As, however, these gentlemen visited the plots monthly, and after careful inspection made such alterations as they saw fit, the mean live-weight per acre in these columns may generally be taken as a very fair measure of the carrying power of each plot. The few exceptions will be referred to later.

The next four columns from the end of the tables give the live-weight gain per sheep per week. Judgment about stocking is scarcely a factor here, for care was taken that the sheep had always enough to eat. This is the verdict of the sheep, and is the most reliable measure of the *feeding quality* of the herbage on each plot.

In the remaining columns the data are given for drawing up a balance between costs and receipts for each plot, and the net gain or loss of treatment is shown as at the end

of the third season. The making up of this balance has involved two matters about which there is room for difference of opinion. Neither point was of much importance at Cockle Park. The results there were quite clear, and it was of little importance if the very handsome profits were a little less or more. But in these Scottish experiments it is entirely different; for the effects of treatment are nothing like so marked, and the details referred to are important factors in the result.

The first difficulty is in regard to how the inequality of plots, as indicated by the increase in live-weight of sheep in 1901, should modify the results in succeeding years. To take an instance from Table I. In the grazing season of 1901, before manures were applied, the live-weight increase per acre was 36 lb. on Plot O and $22\frac{1}{2}$ lb. on Plot B—a difference of $13\frac{1}{2}$ lb. Is this difference to be given effect to in *every one* of the succeeding years? If so, the addition of slag to Plot B at the end of three years has resulted in a net gain of 6s. 6d.; but if the plots are regarded as equal, the result would be a loss of 3s. $7\frac{1}{2}$ d. And other experiments show greater divergences.

On the one side it may be urged that, if one or two sheep on any of the plots in 1901 were exceptionally good or bad thrivers, it would be sufficient to account for most of the apparent inequality between the plots, and that any error thus caused is multiplied by the number of years the experiment is continued. There were two untreated plots at Auchnaskeoch, which gave a live-weight increase per acre of 41 lb. and 23 lb. respectively in 1901—a difference of 18 lb.; but on the average of the four seasons the increase per annum was $49\frac{1}{2}$ lb. and 43 lb.—a difference of only $5\frac{1}{2}$ lb.

On the other hand, the results in 1901 are as reliable as those of any other single year: all are subject to the same criticism, and in most of the experiments the results obtained in 1901 put the plots in much the same order as was expected by the local committees. In Tables I. to VII. the total increase in the three years (1902, 1903, and 1904) in excess of Plot O is given (a) as if all the plots were equal, and

(*b*) allowing in *each year* for the difference in the plots indicated by the trial of 1901. The true result is probably somewhere between the two; but for uniformity the profit or loss is taken from (*b*), and any special reason to prefer the other is noticed in referring to the experiments separately.

The other matter of difficulty is the price per lb. that should be put on the live-weight increase of the sheep. The estimate of the amount of profit or loss due to the treatment depends directly on this price, and it is desirable it should be uniform. The method adopted, apparently, in other similar experiments was to assume that 50 per cent. of the increase was mutton, and that the increase is therefore worth $3\frac{3}{4}$ d. per lb. if mutton sells at $7\frac{1}{2}$ d. In the Scottish experiments, however, this is misleading. The value of summer pasture is what can be realised from it. With very few exceptions the sheep, when taken off the plots, were not fit for the butcher, and were worth more as stores than for killing; and, on an average of years, store-sheep in May cost considerably more per lb. live-weight than they will bring in October. One of the most experienced sheep salesmen in Scotland has been consulted on this matter. After explaining the variations due to seasons, crops, etc., he states that, on an average of the last ten years, he would estimate that sheep of the class used in these experiments would cost 1d. per lb. live-weight more in May than they would bring in October. From this a slight deduction has to be made for value of wool; but even if the difference were only a $\frac{1}{2}$ d. per lb., the effect for such sheep as were used in these experiments would be to make the realisable value of the increase about $2\frac{1}{2}$ d. per lb.¹ At Cockle Park the average butcher's valuation of the sheep from all the ten plots and for seven seasons (1897 to 1903) was 3s. 1d. per head above what they cost² at the beginning of the season, and the average live-weight increase was

¹ *E.g.*, if sheep averaging 70 lb. each in spring cost (after deducting value and weight of wool) 23s. 4d. (= 4d. per lb.), and were sold in autumn for 30s. 7 $\frac{1}{2}$ d. (105 lb. at 3 $\frac{3}{4}$ d.), then the increase of 35 lb. has realised 7s. 3 $\frac{1}{2}$ d., or 2 $\frac{1}{2}$ d. per lb.

² Deducting value of wool.

36 lb.—*i.e.*, little more than 1d. per lb. for increase. If the live-weight increase of these sheep is to be worth $2\frac{1}{2}$ d. per lb., their value as stores must have been on the average 4s. 5d. per head above the butcher's valuation. All the available data in these Scottish experiments has been tabulated for the three seasons, and the average value of the increase comes out at 3d. per lb. This figure has been adopted in the tables in this report, but, owing to the rise in the price of sheep, it is more than could be realised on an average over a longer period.

BOON.

Table II. gives the results obtained at Boon. The pasture here is much rougher than at Sunderland Hall, and is mostly composed of agrostis, but Yorkshire fog, sweet vernal, dogstail, and cocksfoot are also present, and there are plants of white clover all over the plots. In all the other experiments the same number of sheep were put on each plot in 1901; but here the local committee varied the stocking in accordance with the appearance of the plots, and their judgment was justified to the extent that the live-weight gain per sheep per week on all the plots was almost identical in that year (1.2 lb.). At the end of the season, however, some food was left on Plot O, which had grazed only nine sheep; and it is fairly evident that if another sheep or two had been grazed on Plots O, C, and D they would have made some increase. The allowance, therefore, for the results of 1901 is probably exaggerated in this experiment. The live-weight increase in three years of Plot B, *e.g.*, over Plot O, is probably nearer $94\frac{1}{2}$ lb. (from *a*) than $61\frac{1}{2}$ lb. (from *b*).

On Plot A the difference would be even more marked; but even allowing for this, the feeding of cake on Plot A has so far proved very unprofitable. To keep down the strong rough growth, this plot was heavily stocked—four sheep per acre in 1904. This involved a large consumpt of cake, and on the confined area the sheep did not make corresponding progress. Two sheep were removed from this plot in 1904 owing to foot-rot, and the progress of at

TABLE II.—BOON. EXPERIMENT conducted by Dr R. Shirra Gibb, Boon, Lauder, Berwickshire. *Pasture*—17 years old; *Elevation*—900 feet. Blackish moorland soil resting on boulder-clay. Plots of four acres grazed by Cheviot Waddie Hogg, home-bred. Experiment begun 1901; Manures applied February 1902.

RESULTS PER ACRE.

Experiment	Live-weight Increase in 1901 (testing equality of Plots).	Treatment per Acre.	Cost of Treatment.	Live-weight Increase of Sheep in				Live-weight Increase in Three Years in excess of Plot O.		Net Gain + or Loss - from (b) and Cost.	Live-weight Gain per Sheep per Week during Season.				CARRYING POWER.					
				of Sheep in				(a) No Allowance.	(b) Allowing for inequality of Plots as shown in 1901.		Weight in lb.	Value at gd. per lb.	s.	d.	lb.	lb.	lb.	lb.	lb.	lb.
				of Sheep in																
				1902.	1903.	1904.	Total.													
lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.		
A	63	Total of 14 cwt. cotton-cake, half decorticated, eaten by sheep in 1902, 1903, and 1904 (= 83 lb. nitrogen) 10 cwt. basic slag (= 200 lb. phosphoric acid) 10 cwt. basic slag and 210 lb. sulphate of potash (= 100 lb. potash) 9 cwt. superphos. (= 200 lb. phos. acid) and half ton ground lime Untreated	94 0	96	135½	147	378½	215	164	41 0	1-18	1-89	2-07	1-62	224	251	266	341		
B	57		22 6	63	80	115	258	94½	61½	15 4½	1-16	1-53	1-46	1-55	207	199	205	261		
C	52½		35 9	57	82	89	228	64½	45	11 3	1-19	1-38	1-50	1-30	181	196	207	232		
D	56		40 7	59½	70	93½	223	59½	29½	7 4½	1-26	1-43	1-28	1-34	180	197	200	250		
O	46		...	51	47½	65	163½	...	...	...	...	1-16	1-37	1-09	1-28	158	174	158	168	

On 1st June 1901, 12 sheep were placed on Plot A, 11 on Plot B, 10 on Plots C and D, and 9 on Plot O. Two sheep on Plot A died from inflammation and were replaced. Grazing ceased 4th October (17½ weeks). On 23rd May 1902, 11 sheep were placed on Plot A, 9 on Plots B, C, and D, and 8 on Plot O. Grazing ceased 30th September (18½ weeks). After the sheep were removed 18 cattle were put on each plot in succession for 48 hours. On 16th May 1903, 12 sheep were placed on Plot A, 10 on Plots B, C, and D, and 8 on Plot O. One sheep on Plot C was changed on 29th June. Fourteen cattle were grazed for 24 hours on each plot. Grazing ceased 17th October (21½ weeks). On 21st April 1904, 12 sheep were placed on Plot A, 10 on Plots B, C, and D, and 8 on Plot O. On 25th May, 4 sheep were added to Plot A, 2 to Plots B and D, and 1 to Plot C. On 15th September 1 sheep on Plots A and D were removed because of foot-rot, and not replaced, and 6 others in Plot A suffered. Grazing ceased 17th October (25½ weeks). All five plots are credited for cattle grazing in 1902 and 1903 (at 1s. per head per week)=7s. 2d.=1s. 9d. per acre. Deducting wool, the sheep were valued when put on—21s. 4d. in 1902, 28s. 6d. in 1903, and 26s. 8d. in 1904; when taken off, by butcher—80s. in 1902, 29s. in 1903, and 33s. 8d. in 1904, but worth about 2s. a-head more as stores.

least five others suffered from the severe foot-dressings that were necessary.

In this experiment no safe inference can be drawn from the stock carried by the different plots. The difference was as marked in 1901 as in the other years, and in all the plots a considerable roughness was left at the end of the season. The cattle put on in 1903 reduced this slightly, but they seemed not to relish the *agrostis* any more than the sheep. In the spring of 1904 some of the coarsest herbage was burned off.

It is not wonderful that the action of an insoluble manure like slag should be slower on a pasture like this, covered with such a quantity of coarse grass and with a dense sod ; and it is noticeable that upon all the treated plots the increase has been greatest in 1904. On these plots the live-weight gain per sheep was greater than on Plot O, although they were much more heavily stocked. The clover plants are more vigorous on the plots which got phosphatic manure, but there is no evidence of the addition of potash causing any marked improvement.

On the whole, the skilled stock farmers who are in charge of this experiment, while they recognise that the slight increase in 1904 may be the beginning of a more evident improvement in 1905, do not think that the results up to this time give much encouragement for manuring this class of pasture.

Hay Plots.

The areas grazed were as stated in the tables¹ following, but the fences enclosed (except at Auchnaskeoch) $\frac{1}{20}$ th of an acre more on every plot. These sub-plots of $\frac{1}{20}$ of an acre were fenced off, and their produce cut and weighed. Their position on the larger plots was changed annually. The weights of hay obtained, calculated to cwt. per acre, are given in Table VIII. Though the larger plots were fairly comparable the one with the other, there was in almost all the experiments considerable variation in the nature and vigour of the herbage in different parts of the same plot.

¹ See footnote p. 224.

These small sub-plots for cutting were placed by the local committees to represent an average portion of the larger plots, but to those who regularly visited the experiments it was evident that the weight of hay obtained from them was at least as much dependent on their position as upon the treatment the plot had received. In such variable pastures the weight of hay from $\frac{1}{20}$ th of an acre formed no fair test of the productiveness of 4 acres. An examination of the returns bears this out, and shows that it would be entirely misleading to base any general conclusions upon them.

TABLE VIII.—HAY PER ACRE FOR 1901, 1902, 1903, and 1904. Results from Sub-Plots of $\frac{1}{20}$ of an Acre.

No Manure in 1901.

BOON.

Plot.	Manure.	1901.	1902.	1903.	1904.	Three Years 1902 to 1904.
		cwt.	cwt.	cwt.	cwt.	cwt.
A	Ground cake . .	23 $\frac{1}{2}$	16 $\frac{1}{2}$	19	27	62 $\frac{1}{2}$
B	Slag . . .	20 $\frac{1}{4}$	14 $\frac{1}{2}$	16	25	55 $\frac{1}{2}$
C	Slag and potash .	22 $\frac{1}{2}$	16 $\frac{1}{4}$	17	12 $\frac{1}{2}$ *	...
D	Superphos. and lime	19 $\frac{3}{4}$	14	16 $\frac{1}{2}$	4 *	...
O	No manure . .	21 $\frac{3}{4}$	10 $\frac{3}{4}$	12 $\frac{1}{2}$	2 $\frac{3}{4}$ *	...
X	Bone-meal . .	...	...	...	...	...

In some cases the herbage was weighed as soon as cut, and one-third is taken as hay. In other cases it was weighed as hay.

* These sub-plots were on the portion burned in spring 1904, and produced a thick low growth.

This table, in the meantime, is of use mainly in justifying the method that has been adopted in these experiments for measuring the improvement of pastures, for it proves conclusively that the much easier method of cutting and weighing about 1 per cent. of the treated areas gives, on such pastures, an entirely unreliable measure even of the quantity produced on the whole area.

The hay from these sub-plots was submitted to botanical analysis by Professor M'Alpine, who also visited the experiment stations from time to time, and has taken complete and voluminous notes of the nature and variation of the herbage. For the reasons given above, and also because the low-

growing herbage was not proportionately represented in the hay, the analyses without the notes are, in the opinion of Professor M'Alpine, misleading, and it has been thought better that he should supply a complete Botanical Report of the effects of treatment at a later date.

Report on Carcasses.

It was arranged that at the end of each season an average sheep should be selected from each plot and slaughtered, and the carcass weighed. This was done at Sunderland Hall and Boon, and at Naemoor and Hillridge in 1902, and the results are given in Table IX. In the other cases the whole of the sheep were so evidently unfit for the butcher that the joint-committee did not insist on slaughter. The small difference in the percentage of carcass in such stores probably depended more on the selection of the sheep for slaughter than on the treatment the plot had received.

TABLE IX.—PERCENTAGE OF CARCASS IN UNFASTED LIVE-WEIGHT.
BOON.

Plot.	1902.	1903.	1904.	Mean.
	Per cent.	Per cent.	Per cent.	Per cent.
A	49·5	44·2	48·1	44·6
B	46·6	43·0	44·9	41·3
C	44·7	42·2	45·2	41·4
D	46·0	42·7	42·4	41·4
O	46·5	47·1	47·5	42·2

Five sheep were weighed fasted before killing, and had lost, with little variation, 7·7 per cent. of their unfasted weight. The percentage of carcass to fasted live-weight would therefore be from 3 per cent. to 4 per cent. above the figures given in the table.

The sheep at Boon were Cheviots.

Mr M'Bryde of Newcastle, who killed the Boon sheep, reported that they were all about equal as to quality, and all prematurely in the market. The butcher who slaughtered the Sunderland Hall sheep in 1904 reported that those selected from Plots A and B were "nice quality," from Plots C and O "fair quality," from Plot D "poor quality," and one of the reserve sheep grazed outside the plots, which gave 42·2 per cent. of carcass, "rather poor quality."

Survey of Results.

No useful information could be got from average tables prepared from all these seven experiments, for each varied from the other in the all-important factors of climate, soil, and herbage. It is not the object of this preliminary report to deduce definite conclusions. At the same time, it is evident that the results so far obtained are very disappointing compared with those obtained during the first three years of the similar experiment at Cockle Park. The profit shown there was quite astonishing, but no figures nor description could produce the impression received on visiting the plots themselves. The herbage and sheep had to be seen to realise it. There is nothing approaching this in any of the Scottish experiments. A little improvement in the appearance of the treated plots, but, speaking generally, that is all.

What is the cause of the difference? Professor Middleton, in a very interesting report,¹ has ascribed the wonderful effects at Cockle Park to its being a "true slag soil." He defines a slag soil as "a poor clay pasture covered with small clover plants and with bent (*Agrostis* sp.)." The agrostis does not make a close sward on the clay-soil pastures in Northumberland, and when the slag encourages the clover, it has room to spread, and its runners are sheltered by a "rough thin covering of agrostis." All the good effects of an abundant and vigorous growth of clover follow, changing in a few years the whole character of the herbage.

Several of the Scottish soils come near Professor Middleton's description of a slag soil. Agrostis is the prevailing grass, more so than at Cockle Park, poor little clover plants can be found all over, the soil is stiff, and there is generally plenty of moisture; but on these stiff soils the agrostis along with other low-growing herbage does form a thick and close sward. It may well be that the slowness of effect of the slag, on such pastures as those at Boon and Holystone, is not so much due to the time the insoluble

¹ Sixth Annual Report of Experiments at Cockle Park (1902), pp. 14-16.

phosphoric acid requires to get through this dense sod and mass of inert organic matter to the roots, as to the fact that the vigour and spread of clover is checked from want of room. The barer the soil the more rapid is the effect of slag.

It has to be remembered, however, that this Northumberland clay is not a "poor" soil. When wheat was selling at 50s. per quarter it commanded a rent of 30s. an acre and upwards. After it had been grazed twenty or thirty years it was starving for want of phosphates. That was the weak link in a fairly strong chain. Given an abundant supply in the slag, this soil, in other respects naturally good, physically and chemically, by the help of clover, soon accumulates nitrogen and organic matter, and becomes capable of fattening sheep or cattle. From being worth 5s., it becomes in a few years worth 26s. an acre.

The large area of poor pastures in Scotland are not, however, on land of this class. The Cockle Park soil contained only .005 per cent. of available phosphoric acid, as determined by Dyer's method, while the Scottish soils, of which analyses are given in Table X. contained from four to twelve times this amount. In fact, judged by this method, they were considerably richer in available phosphoric acid before treatment than was the Cockle Park soil after it had received 10 cwt. slag per acre.

From both points of view—the thick-set sod and the soil content—it is not wonderful that these Scottish soils are not so grateful for an application of basic slag. The wants of second-class soils like these seem to be more general. They are not always clearly indicated by analysis, and may be more physical and biological than chemical. It is comparatively easy to increase by manuring the quantity of produce, whether it be turnips, straw, or grass, from such soils, but experiments so far have failed to materially increase the feeding quality of this produce. This kind of poor land cannot be made into a fattening pasture, at all events cheaply or quickly. Clovers and the best grasses may be encouraged, but they have not the virtue that belongs to them on "good land."

While, however, it is already evident that there will be no such rapid transformation as was effected at Cockle Park, it by no means follows that the treatment of these pastures will not ultimately prove profitable. In all the experiments there has been a marked increase in the quantity of stock the land has carried, and in most cases

TABLE X. ANALYSES OF SOILS AND SUBSOILS. Parts in 100 of air-dried Sample.

BOON.

	Soils.			Subsoils.		
	Plots.			Plots.		
	A.	C.	O.	B.	D.	O.
Water	5.68	7.60	4.83	1.97	2.00	1.90
Stones	7.15	7.94	32.99	48.11	52.42	35.09
Gravel	7.28	6.15	4.72	6.49	6.90	6.42
Fine soil passing through No. 20 wire-cloth	79.89	78.31	57.46	43.43	38.68	56.59
	100.00	100.00	100.00	100.00	100.00	100.00
ANALYSES OF FINE SOIL—						
Organic matter and combined water	19.82	24.95	14.42	6.43	6.12	5.80
Nitrogen	0.448	0.595	0.367	0.126	0.147	0.119
Soluble in Hydrochloric acid {	Phosphoric acid	0.058	0.063	0.052	0.033	0.031
	Potash	0.058	0.038	0.041	0.033	0.039
	Lime	0.041	0.041	0.055	0.029	0.086
	Magnesia	0.019	0.013	0.007	0.008	0.007
	Ferric oxide	0.581	0.461	0.586	1.79	1.75
Soluble in Citric acid (Dyer's method) {	Alumina	0.404	0.339	0.454	1.00	1.17
	Phosphoric acid	0.032	0.028	0.022	0.032	0.020
	Potash	0.007	0.018	0.015	0.015	0.020

The samples were taken by auger, and many cores from different parts of each plot were mixed to form the sample. The surface soil was taken to the line of demarcation with the subsoil. The depth, therefore, varied, but never exceeded 9 inches.

this increased stock has been better done. It has to be remembered that in all the tables the treated plots are credited with the increase produced during about twenty weeks only of each year. Such hill pastures are generally grazed all the year round, and there is no doubt that they would continue to be more nutritive during the other thirty-two weeks. Moreover, as has been observed, no

value has been put on the manurial residues. In some of the experiments, even without making allowance for these assets, the cost of the slag has been already repaid, as well as a considerable part of the cost of the potash. Generally the increase over the unmanured plot in 1904 is as great as, and in some cases considerably greater than, in either of the previous years, and it only requires that this maximum be continued for two or three years longer to make the treatment distinctly profitable.

At the present stage the eating on of cake seems over all the least promising outlay. If the clover had been encouraged, and better grasses established before cake was given, the good effect of the manurial residue would probably have been more evident. The feeding of cake on Plots A will soon be stopped and the value of the residue tested, and observation of the various plots from time to time may suggest variations in the treatment of the other plots.

Meantime the joint-committee have decided to make no changes for at least one more season.

IV

IMPROVEMENT OF HILL PASTURE AS DETERMINED BY THE EFFECT ON STOCK.—EXPERIMENTS IN SCOTLAND.¹

By JAMES HENDRICK, B.Sc., F.I.C.

THE experiments with which this report deals were begun in 1901, and after the death of my predecessor, Dr Aitken, who had been associated with them from their commencement and had taken charge of the collection and tabulation of the results, Dr Wilson of Carbeth undertook the task of drawing up a report on the results of the first four years. This was published in the *Transactions* of the Society in 1905, p. 271.

Objects of the Experiments.

The experiments were intended to test whether certain manures could be profitably applied to poor hill pastures. The well-known experiments carried out at the Northumberland County Experimental Farm of Cockle Park (see *Transactions*, 1900, p. 75) showed that on poor pasture there most remunerative returns could be obtained by the application of phosphatic manures, and especially of basic slag. In the Cockle Park experiments there were ten different plots. In each of the experiments with which we are here dealing there were only five plots; but the experiments were repeated on various types of poor pasture, situated under different conditions of climate and rainfall, and on soils which differed considerably from one another. The varieties of treatment given to the pastures were fewer than at Cockle Park—for those manures only are included

¹ See *Transactions, Highland and Agricultural Society of Scotland*, vol. xx. (1908), pp. 269-304. Extracts applicable to Boon.

in the experiments which there was reason to believe, from previous experience, were likely to give a useful result. It was intended to test the effects of these manures under a considerable variety of conditions, so as to gain information as to how far remunerative improvement could be effected by manuring on the extensive areas of poor hill pasture of different kinds which are found in Scotland.

Methods of Experiment.

In each of the experiments one of the plots—Plot O—was untreated, and represented the unimproved condition of the pasture. The treatment given to the other four plots was as follows:—

Plot A. Sheep fed with a mixture of equal parts of decorticated and undecorticated cotton-cake on the plot.

Plot B. Basic slag, 10 cwt. per acre.

Plot C. Basic slag, 10 cwt. per acre, and sulphate of potash, 210 lb. per acre.

Plot D. Superphosphate, 9 cwt. per acre, and ground lime, 10 cwt. per acre.

The basic slag and superphosphate applied on plots B, C, and D supplied about 200 lb. of phosphoric acid per acre, and the sulphate of potash on Plot C supplied 100 lb. of potash per acre.

Plot A was manured through the manurial residue of the cake fed to the sheep. In the case of the East of Scotland experiments the cake feeding was continued for four years, 1902 to 1905, and during 1906 and 1907, when it was discontinued, the effect of any residue it had left in the soil was measured.

In general, the method of experiment was that adopted at Cockle Park. The improvements effected by the manures were measured by feeding stock on the plots and determining the increase in live-weight of the stock. This method of experiment, though open to objection, is the best one available for measuring the feeding value of pasture, which

depends not merely upon the quantity of herbage yielded, but even more upon its nature and quality. The stock fed upon the plots was almost entirely sheep, though in a few cases, which will be noticed later, cattle also were fed. The plots were each four acres in extent. Each experiment was under the charge of a committee of practical men, who arranged along with the experimenter as to the stocking and other details of the experiment. The services of these committees were of the highest value. The success of the experiments largely depended on the proper stocking of the plots, so as to take full advantage of the amount of food produced by each. This required local knowledge, as well as judgment and knowledge of sheep. The committees inspected the plots at the time of the weighing of the sheep, which was, as a general rule, done monthly. The members of the committees have all through shown great interest in the experiments, and a number of them have declared that the results have in many respects been a great surprise to them. A matter which surprised many and was frequently spoken of was that sheep could be confined on such small areas during the whole grazing season in sufficient numbers to eat down the grass and yet remain healthy and thriving. On the whole, the health of the sheep in these experiments has been good. It was readily acknowledged that it was quite as good as could be expected among sheep running on large areas of similar land.

Another matter about which surprise was frequently expressed by practical men who were present at the weighings and saw what increase the sheep made from month to month, was the great proportion of the increase which was made during the early part of the season as compared with the later part. While it was stated that sheep-men were generally aware that sheep did better on the young grass in the early summer than they did on the older herbage of late summer and autumn, great astonishment was sometimes expressed when the evidence of the weigh-bridge showed how large a part of the season's increase was produced in May and June.

Generally speaking, the grazing season in the experiments lasted about five months. In the West of Scotland experiments it was always twenty weeks. In the East experiments it varied somewhat from year to year. The sheep were generally put on the plots in May and taken off in October.

— BOON.

The results from Boon are given in Tables IV. and V. This experiment is very different from that at Sunderland Hall. The soil here is naturally covered with a thick coarse mat of herbage chiefly composed of *Agrostis*. The soil is very rich in humus matter and nitrogen. The growth of poor, coarse *Agrostis* is so thick that even when aided by manures, such as lime and superphosphate or basic slag, the clover plants cannot spread on account of want of room, and are simply crowded out and shut off from light and air by the gross growth of *Agrostis* on this strongly nitrogenous soil. The surface also is so covered by a dense, closely-entwined mat of slowly-decaying *Agrostis* roots, that the manures can only slowly reach the soil. The improvement, therefore, has only been slowly produced on these plots, and was not obtained by feeding sheep only on the plots. Sheep did not appear to be able to tread down or eat down the coarse tussocks of old *Agrostis* which covered the soil and prevented the spread of clover. The committee therefore placed cattle on the plots during the early part of the season 1906. Their opinion that cattle would tread and eat down the plots better than sheep was fully justified by the result, and probably a better result would have been obtained in this experiment had cattle been used earlier and oftener. The cattle not only made large live-weight increases themselves but improved the plots for the sheep in 1907. The cattle were young, rough beasts, and remained upon the plots for sixty-four days. When put on they averaged about 3 cwt. 3 qrs. each. As a consequence of the treading by cattle, by the end of 1906, and still more in 1907, the plots were greatly improved in appearance. The clover increased considerably on Plots B, C, and D, and even Plots A and D

TABLE IV.—BOON. EXPERIMENT conducted by Dr R. Shirra Gibb, Boon, Lauder, Berwickshire. *Pasture*—21 years old; *Elevation*—900 feet. Blackish moorland soil resting on boulder-clay. Plots of four acres grazed by Cheviot Waddar Hogg, home-bred. Experiment begun 1901; Manures applied February 1902.

RESULTS PER ACRE.

Plots.	Live-weight Increase in 1901 (testing equality of Plots).	Treatment per Acre.	Cost of Treat- ment.	Live-weight Increase of Sheep in--						Total.		Live-weight Increase in Six Years in excess of Plot O.						Net Gain (+) or Loss (-) from (b), de- ducting Cost of Treat- ment.
				1902.	1903.	1904.	1905.	1906.	1907.	Sheep.	Cattle (in 1906).	(a) No Allowance.		(b) Allowing for Inequality of Plots, as shown in 1901.		Value.		
												Sheep.	Cattle (in 1906).	Sheep.	Cattle (in 1906).			
																	lb.	
Unmanured, but sheep fed from 1902 to 1905 includ- ing with cotton-cake, half decorticated. Total cake per acre in four years, 2044 lb. No cake fed in 1906 and 1907	122 6	96	135½	147	149	16½	108½	652½	145½	374	80	272	80	68 0	8 4	-46 2		
A	63	{ Basic slag, 10 cwt., con- taining phosphoric acid (=200 lb.) Basic slag, 10 cwt., and 210 lb. sulphate of potash (=100 lb. potash) 9 cwt. superphosphate (= 200 lb. phosphoric acid) and 10 cwt. ground lime Untreated.	22 6	63	80	115	84	20½	90½	453	96½	174½	31	108½	31	27 1	3 3	+ 7 10
B	57		35 9	57	82	89	70	25½	104	427½	97½	149	32	110	32	27 6	3 4	- 4 11
C	52½		40 7	59½	70	93½	64	29½	106½	423	75½	144½	10	84½	10	21 1	1 0	-18 6
D	56		...	51	47½	65	42	16	57	278½	65½	...	...	...	...	...	...	...
O	46																	...

TABLE V.

Plot.	Live-weight Gain per Sheep per Week during Season—								Carrying Power. Mean Live-weight per Acre in—							
	1901.	1902.	1903.	1904.	1905.	1906.*	1907.	Average 1902-07.	1901.	1902.	1903.	1904.	1905.	1906.*	1907.	Average 1902-07.
A	lb. 1·18	lb. 1·89	lb. 2·07	lb. 1·62	lb. 1·92	lb. 0·69	lb. 1·36	lb. 1·49	lb. 224	lb. 251	lb. 266	lb. 341	lb. 307	lb. 220	lb. 253	lb. 273
B	1·16	1·53	1·46	1·55	1·48	0·87	1·26	1·36	207	199	205	261	214	214	223	219
C	1·19	1·38	1·50	1·30	1·23	1·08	1·44	1·32	181	196	207	232	208	216	231	215
D	1·26	1·43	1·28	1·34	1·24	1·17	1·47	1·32	180	197	200	250	190	231	232	217
O	1·16	1·37	1·09	1·28	1·06	0·85	1·31	1·16	158	174	158	168	135	172	136	157

On 1st June 1901, 12 sheep were placed on Plot A, 11 on Plot B, 10 on Plots C and D, and 9 on Plot O. Two sheep on Plot A died from inflammation and were replaced. Grazing ceased 4th October (17½ weeks). On 23rd May 1902, 11 sheep were placed on Plot A, 9 on Plots B, C, and D, and 8 on Plot O. Grazing ceased 30th September (18½ weeks). After the sheep were removed 18 cattle were put on each plot in succession for 48 hours. On 16th May 1903, 12 sheep were placed on Plot A, 10 on Plots B, C, and D, and 8 on Plot O. Fourteen cattle were grazed for 24 hours on each plot. Grazing ceased 17th October (21½ weeks). On 21st April 1904, 12 sheep were placed on Plot A, 10 on Plots B, C, and D, and 8 on Plot O. On 25th May, 4 sheep were added to Plot A, 2 to Plots B and D, and 1 to Plot C. On 16th September 1 sheep on Plots A and D were removed because of foot-rot and not replaced, and 6 others in Plot A suffered. Grazing ceased 17th October (25½ weeks). On 17th April 1905 12 sheep were placed on Plot A, 10 each on Plots B, C, and D, and 8 on Plot O. On 22nd May 2 sheep were added to Plot A, and 1 each was removed from Plots D and O. Grazing ceased on 23rd September (22½ weeks). On 11th May 1906, 6 young cattle were placed on each of Plots A, B, C, and D, and 6 on Plot O. They remained on the plots till 14th July (9½ weeks). On 30th July 9 sheep were placed on Plot A, 8 each on Plots B, C, and D, and 6 on Plot O. One sheep died suddenly on Plot O and was replaced from the reserve. One sheep was removed from Plot A on 30th August, and 1 was added to Plot D and 1 to Plot O on the same date. Grazing ceased on 20th October (11½ weeks for sheep). On 19th April 1907, 11 sheep were placed on Plot A, 10 each on Plots B, C, and D, and 6 on Plot O. No alterations were made during the season. Grazing ceased on 7th November (28½ weeks).

* With cattle.

showed distinct improvement. The cattle themselves made increases which surprised those in charge of the experiment. They made quite as great an increase in the sixty-four days as was commonly made by the sheep during the whole season. By far the greatest increase, and also the greatest increase per head, 97 lb., was made on plot A. This plot was the roughest of all, as the nitrogenous manuring resulting from the cake-feeding had promoted the growth of grass to a considerable extent. The great increases made by the sheep on Plots C and D in 1907 were quite in keeping with the improved appearance of these plots after the cattle-feeding. Dr Wilson pointed out that the results in 1901 cannot be relied upon as giving a true estimate of the relative values of the plots in this experiment. They probably place Plots A and B in particular at a disadvantage. The estimates, therefore, of the net gain or loss from the treatment shown in the last column of Table IV. are probably not accurate. If the gains had been calculated without any allowance for 1901 they might have been nearer the truth. Still, making all allowance for this, the cake-feeding (Plot A) has not paid. This land does not want nitrogenous manuring. It is already quite rich enough in nitrogen, and the cake-feeding has only resulted in an increased growth of grass. If this plot were now to have a dressing of slag and to be heavily stocked with cattle, a considerable improvement might be effected, but, as at Sunderland Hall, the cake-feeding alone is not remunerative, and does not really improve the pasture. Plots B, C, and D have all been considerably improved, and are only now showing the full effect of the improvement. Only on Plot B has the cost of the dressing been repaid, and even there the balance left over is small. As has been already pointed out, however, it should probably be considerably greater than is shown in the table, say about 20s. instead of 7s. 10d. The addition of potash has done no good. Plot C has never been any better than Plot B. The potash manure has not repaid even a part of its cost. The plot which is now showing the greatest improvement is D. But it showed little improvement in the earlier years of the experiment, and has not repaid the

cost of the manures. Of the manures applied, therefore, slag seems to be the only one which gives a sufficient return to repay the cost of the dressing. Even with slag the margin left for profit is small.

General Results.

The results of the Scottish experiments by no means confirm those of the Cockle Park experiment. The conditions were quite different. At Cockle Park the soil was a fairly good one, which in the days when it was profitable to grow wheat fetched a good rent, but it had been exhausted, especially in phosphoric acid. On the other hand, the Scottish soils were nearly all naturally low-class soils, and their poverty does not appear to depend merely on any chemical deficiency. Generally speaking, they are well supplied with nitrogen and potash, and do not show any marked poverty in phosphate. The addition of phosphate, therefore, did not produce any such effect as at Cockle Park. Potash, as a rule, produced little effect, and gave no more result than at Cockle Park. It has not paid its way, since the soils were not in any great need of it. The only plot to which nitrogenous manure was applied was the cake-fed plot. Feeding a mixture of cake such as was used in these experiments practically amounts to nitrogenous manuring. The cake used supplied per 1000 lb. about 50 lb. of nitrogen, or more than is contained in 2 cwt. of sulphate of ammonia. Most of this is recovered in the droppings of the sheep. At the same time, it supplies small dressings of phosphoric acid and potash equal in each case to about 20 lb. per 1000 lb. of cake. Even in the case of Boon, where a large amount of cake was fed on Plot A, the dressing of phosphoric acid and potash was only a small one, but the nitrogen dressing was comparatively heavy. Nitrogen was the constituent above all others with which soils like those of Boon and Naemoor did not require to be dressed; they rather needed to be broken up, limed, and aerated, and to have some of their organic matter and its nitrogen oxidised. It is not to be wondered at that cake-feeding effected no permanent

improvement. It merely added to a constituent already in excess.

What many of the soils seemed to require more than manuring was improvement in their physical condition. In some cases they are not deep enough, and have no body in which to retain a sufficient supply of moisture. They are liable to be flooded and soured in wet weather and parched in dry weather. In other cases they appear to be too wet, and to want means of readily getting rid of surplus water. On these points, however, we have few data, and cannot draw any general or accurate conclusions, except that it does not appear to be the want of nitrogen, phosphates, and potash, so much as want of "condition," which is wrong with these soils.

A number of the practical men connected with these experiments expressed surprise at the carrying power of the plots in their unimproved state. It was frequently stated that the untreated plots carried more sheep than would have been carried by an equal area of the same land in a large field where the sheep had liberty to roam about. One experimenter also was strongly of opinion that the sheep preferred the enclosed plots and throve better on them. On the other hand, Mr Scott Plummer, who went carefully into the question, came to the conclusion that at Sunderland Hall no greater weight of sheep per acre was carried on the small enclosed area of the untreated plot than on the large areas on the hill, but that the carrying power per acre was approximately the same in both cases.

The general results of the experiments may be summarised as follows:—

1. The great and rapid improvement which was effected by phosphatic manures, and especially by basic slag, on the plots at Cockle Park has not been obtained on any of the plots in Scotland.
2. An improvement was effected by all the manures, but of the manures used it is only basic slag which has in general effected sufficient improvement to make the application remunerative.

3. Even in the case of basic slag, on the average three or four years elapsed before sufficient return was obtained to pay for the slag. On the other hand, the effect of the slag is by no means exhausted even after six years, but in the case of the majority of the experiments it is still giving as great, or nearly as great, returns as ever.
4. Potash, in the form of sulphate of potash, applied along with basic slag, though it gave a small increase in most of the experiments, did not give sufficient return to pay for its cost. Though the same dressing of potash could be obtained a little more cheaply in other forms, there is no reason to suppose that the results would be essentially different on these soils.
5. Superphosphate and lime, though in all cases this dressing gave a considerable increase in mutton, did not in general give sufficient return to be remunerative. In no case did it give so good a return as the cheaper dressing of slag alone.
6. The feeding of cake gave the worst return of all for the expenditure. So far as the experiments show, very little result is recoverable from the manure value of cake on these soils.
7. On some of the experiments the soil was covered with a very thick coarse sod of grass of poor quality. On such land clover plants have not room to develop, and in these experiments the effect of the manure is shown only very slowly. Sheep alone are unable to eat down the grass sufficiently, and better results are obtained when both sheep and cattle are grazed on the same plots.

V

IMPROVEMENT OF HILL PASTURE AS DETERMINED BY THE EFFECT ON STOCK.¹

By JAMES HENDRICK, B.Sc., F.I.C.

THE following is the third and final report upon a series of experiments on the improvement of poor hill pasture by the application of manures and by cake-feeding, which were begun in 1901, and which have therefore been continued for ten years.

BOON.

The results of this experiment are summarised in Tables III., IV., and V. The pasture on these plots was very different from that at Sunderland Hall. The soil is naturally covered with a very thick coarse mat of herbage, composed chiefly of agrostis. The agrostis grows into rough thick tussocks, which are almost useless as food for sheep. The main difficulty is to get rid of this thick, vigorously-growing covering of bad grass in order to allow finer grass and clover to grow. Manures can only gradually reach the soil through the thick felt of old and partly-decayed agrostis and agrostis roots with which it is covered. The soil is very rich in humus matter and nitrogen, but needs phosphate and lime. In order to produce a radical improvement the thick mat of old herbage requires to be removed, and this can be done thoroughly only by breaking up this old pasture with the plough. On this account this experiment, though it was carried out in the most thorough manner and received the greatest care and attention from Dr Gibb and his committee, is not of so satisfactory a nature as that at Sunderland Hall.

¹ See *Transactions, Highland and Agricultural Society of Scotland*, vol. xxiii. (1911), pp. 190-216. Extracts applicable to Boon.

TABLE III.—BOON. EXPERIMENT conducted by Dr R. Shirra Gibb, Boon, Lauder, Berwickshire. *Pasture*—23 years old; *Elevation*—900 feet. Blackish moorland soil resting on boulder-clay. Plots of four acres grazed by Cheviot Wedder Hogs, home-bred. Experiment begun 1901.

RESULTS PER ACRE.

Plots.	Live-weight Increase in 1910 (testing equality of Plots).	Treatment per Acre.	Cost of Treatment.	Live-weight Increase.						Total.			Live-weight Increase in Nine Years in excess of Plot O.						Net Gain (+) or Loss (-) from (b), deducting Cost of Treatment.
				Sheep.			Cattle.			Sheep (in 9 Years).	Cattle (in 2 Years).	(a) No Allowance.		(b) Allowing for Inequality of Plots as shown in 1901.		Value.			
				1902 to 1907 inclusive.	1908.	1909.	1910.	1906.	1908.			Sheep.	Cattle.	Sheep.	Cattle.		Sheep at 3d. per lb.	Cattle at 14d. per lb.	
A	63	{ Sheep fed from 1902 to 1905 inclusive with cake. 10 cwt. basic slag applied February 1908 (=approximately 138 lb. phosphoric acid)	s. d. 142 1	lb. 652½	lb. 17	lb. 111	lb. 75	lb. 145½	lb. 170½	lb. 855½	lb. 316	lb. 460	lb. 150	lb. 307	lb. 150	s. d. 76 9 15	s. d. 8	s. d. -49 8	
B	57	{ Basic slag, 10 cwt., applied February 1902 (=approximately 200 lb. phosphoric acid)	22 6	453	26	80	67	96½	178½	626	275	230½	109	131½	109	32 11 11	3	+21 11	
C	52½	{ Same as Plot B, and 210 lb. sulphate of potash (=approximately 100 lb. potash)	35 9	427½	21	85	63	97½	156	596½	253½	201	87½	142½	87½	35 8	9 11	+ 9 10	
D	56	{ 9 cwt. superphosphate (=approximately 200 lb. phosphoric acid and 10 cwt. ground lime)	40 7	423	33	97	85	75½	192	638	267½	242½	101½	152½	101½	38 2	10 6	+ 8 1	
O	46	Untreated	...	278½	13	52	52	65½	100½	395½	166	...	...	...	...	...	...	...	

TABLE IV.

Plots.	Live-weight Gain per Sheep per Week during Season —						Carrying Power.					Mean Live-weight per Acre in—			
	1901.	Average 1902-7.	1908.*	1909.	1910.	Average 1908-10.	Average 1902-10.	1901.	Average 1902-7.	1908.*	1909.	1910.	Average 1908-10.	Average 1902-10.	lb.
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	
A	1·18	1·49	0·66	1·63	1·09	1·13	1·31	224	273	242	235	220	232	253	
B	1·16	1·36	1·02	1·40	1·30	1·24	1·30	207	219	254	197	191	214	217	
C	1·19	1·32	0·81	1·49	1·22	1·17	1·24	181	215	249	191	182	207	211	
D	1·26	1·32	1·29	1·41	1·49	1·37	1·34	180	217	245	219	219	227	222	
O	1·16	1·16	0·71	1·51	1·30	1·17	1·17	158	157	176	108	138	141	149	

On 13th May 1908, 6 young cattle were placed on each plot. They remained on the plots till 17th July (9 weeks). On 28th July 10 sheep were placed on Plots A, B, C, and D, and 7 sheep on Plot O. Grazing ceased on 9th October (10½ weeks).
 On 8th May 1909, 12 sheep each were placed on Plots A and D, 10 each on Plots B and C, and 6 sheep on Plot O. No alterations were made during the season. Grazing ceased on 16th October (23 weeks).
 On 30th April 1910, 12 sheep were placed on Plot A, 10 on Plot D, 9 each on Plots B and C, and 7 on Plot O. No alterations were made during the season. Grazing ceased on 7th October (22½ weeks).

* With cattle.

As has been pointed out in previous reports, the preliminary experiment in 1901 did not give so reliable a result as at Sunderland Hall. This was largely due to the peculiar nature of the ground, which produces large quantities of grass of very low feeding value for sheep. Possibly if the gains were calculated without making any allowance for 1901, they would be quite as near the truth as when allowances are made in accordance with the results of 1901.

All the plots in this experiment showed very little improvement during the first two or three years after the manures were applied. This was probably on account of the thick mat of herbage through which the manures had to work before they could produce any effect. At the time of the first report all the plots showed a loss. This was converted into a gain at the time of the second report only in the case of Plot B, but as shown in Table III., Plots B, C, and D all show profits after nine years. These profits should probably be greater than shown in the table, for the allowances made in accordance with the results of 1901 reduce the increase shown by these plots as compared with Plot O. As stated above, it is doubtful if these corrections are necessary. As in the case of Sunderland Hall, slag alone, Plot B, shows by far the greatest profit. The potash on Plot C has not paid its cost—indeed it has done practically no good at all in this experiment. Superphosphate and lime, Plot D, shows only a small profit. The relative positions of these plots are probably correct, and no difference would be made in them were no allowances made for inequalities of the plots in accordance with the results of 1901, though the profits in each case would then be considerably greater.

As in the case of Sunderland Hall, Plot A has never paid. Little or no return has been obtained for the manurial residue from the large amount of cake fed on this plot, and the slag applied to it in 1908 has barely repaid its cost in the three seasons which have passed since it was applied. The effect of the cake feeding was to cause the poor grasses to grow more vigorously, and

the plot to become even rougher than in the unimproved state. After slag was applied in 1908 the quality of the pasture slowly improved, just as in the case of Plot B after the slag was applied to it in 1902. Plots B, C, and D, which received phosphatic manures were all improved, both in carrying power and in live-weight increase per sheep per week (see Table IV.) by the treatment. The improvement was shown by the spreading of fresh green patches, and by the increase of white clover on these plots. The difficulty was to get rid of the coarse tussocky material, so as to give the fresh grass and clover a chance. The improved condition of all these plots continued quite to the end of the experiment. The tables show that in no case was the effect of the manure exhausted at the end of nine years. During the last three years of the experiment, Plot D, superphosphate and ground lime, which till then had given disappointing results, gave better results than either B or C. The appearance of the plot was quite in accordance with the results shown by the sheep. At the end of the experiment Dr Gibb considered it the best plot of the five. In this case the superphosphate and lime seemed even slower in effecting an improvement than the slag.

Cattle were fed on these plots from time to time in order to assist in tearing up and treading down the thick rough herbage which sheep would not touch. The results for cattle are shown in Table III. for the years 1906 and 1908. In these years the plots were stocked entirely with cattle during the first half of the season. The cattle feeding in 1906 was described in the second report. In 1908 six young cattle were placed on each plot. The results were very much as in 1906. The cattle made surprising progress on such poor pasture, and their live-weight increase was on the whole proportional to that made by sheep on the same plots. But the cattle made much more increase in live-weight than sheep. Roughly speaking, the cattle made in nine weeks twice as much increase as sheep usually made on the same plots in the whole season of twenty to twenty-five weeks. The improvement of the different plots

by the manuring is even more distinctly shown in the case of the cattle than in the case of sheep. Table V. shows the live-weight gain per beast per week made by the cattle in 1906 and 1908. It will be seen that on Plot D the cattle made in 1908 over 2 lb. per head per day during the whole nine weeks they were on the plot, and on Plot B the result was not far short of this, while Plots A and C were not far behind.

The primary object in putting the cattle on the plots was to improve the plots by getting rid of the roughness. The plots were therefore heavily stocked. Table V. shows the live-weight per acre carried in the case of cattle, and it will be seen that on the average it is over three times as

TABLE V.—CATTLE.

Plots.	Live-weight Gain per Head per Week during Season—			Carrying Power—Mean Live-weight per Acre in—		
	1906.	1908.	Average.	1906.	1908.	Average.
	lb.	lb.	lb.	lb.	lb.	lb.
A	10 $\frac{3}{5}$	12 $\frac{3}{8}$	11 $\frac{5}{8}$	708	761 $\frac{3}{4}$	734 $\frac{7}{8}$
B	7	13 $\frac{3}{8}$	10 $\frac{1}{8}$	659	761 $\frac{1}{4}$	710 $\frac{5}{8}$
C	8 $\frac{1}{2}$	11 $\frac{5}{8}$	10 $\frac{1}{2}$	566 $\frac{5}{8}$	748 $\frac{1}{4}$	657 $\frac{1}{2}$
D	6 $\frac{1}{2}$	14 $\frac{3}{8}$	10 $\frac{1}{8}$	557 $\frac{3}{8}$	780 $\frac{5}{8}$	669
O	7	7 $\frac{1}{8}$	7 $\frac{3}{8}$	459 $\frac{3}{4}$	754 $\frac{1}{4}$	607

great as the live-weight of sheep carried by these plots. The cattle served admirably for the purpose for which they were placed on the plots. They trod down and ate down the roughness, and much improved the condition of the plots. But it was not expected that they would themselves make such great increases in live-weight as the tables show them to have made. It would undoubtedly have been to the advantage of the Boon experiment if cattle could have been used more freely on the plots. On this kind of land, where rough grass grows so freely, young rough cattle are able to consume and thrive on much that is of no use to sheep, and at the same time they improve the plots for sheep by their treading.

In addition to the cattle feeding recorded in the tables,

a number of cattle were run over the plots for short periods on other occasions. For instance, in 1910 a number of cattle were fed on each plot in turn for forty-eight hours at the beginning of the season. Dr Gibb records that they would have done more good to the plots if they had been kept on twice as long. As these cattle were pastured equally on all the plots, and were not weighed, no allowance is made for them in estimating the gains and losses.

The sheep remained, on the whole, healthy on these plots all through. In some years there was a little trouble on this rough land with their feet, but the trouble did not reach serious dimensions, and was not sufficient to seriously affect the results of the experiment.

Conclusions.

The results of these three experiments, which have been carried out with, on the whole, great care and accuracy for the long period of ten years, are well marked and consistent. Though the three centres all differed from one another markedly in soil and situation, they all give results which are in the main in agreement. The results are, as pointed out in the second report, in certain respects dissimilar to those obtained at Cockle Park. This is to be expected, as the soils and conditions are also dissimilar.

The main result of all these experiments is to support the view that the chemical constituent most needed by such poor pastures is phosphate, and phosphate in a basic form combined with excess of lime. In this these experiments give a result in agreement with that of the Cockle Park experiments. But the extraordinary results obtained with slag at Cockle Park have not been obtained in any of these experiments. It is now generally recognised that phosphate is the manurial substance which has the greatest effect in improving the quality of poor pasture.

These experiments were conducted upon land which is typical of much of the poor hill pasture land of Scotland. Such land is, generally speaking, not deficient in nitrogen. In fact, it is very often, as at Boon and Naemoor, black and moorish, and only too well supplied with humus matter

and nitrogen. These soils are frequently fairly well supplied with potash. Of chemical constituents they most require phosphate and lime. But they also require what cannot be given by the addition of any manures—good physical texture and condition. As was stated in the second report: "What the soils seemed to require more than manuring was improvement in their physical condition. In some cases they are not deep enough, and have no body in which to retain a sufficient supply of moisture. They are liable to be flooded and soured in wet weather and parched in dry weather."

Formerly the chief methods which were advocated for the improvement of poor hill pasture were draining and liming. These methods of improvement were fully set out in an article entitled "The Improvement of Hill Pasture without Breaking it Up," which was awarded a premium in the *Transactions* for 1887, pp. 158-174. In this paper the use of phosphates is not advocated at all, but dressings up to five tons of lime per acre are recommended. The Cockle Park experiments and all the other experiments which have followed it have had this valuable result; they have shown that, above all things, phosphate is needed to improve poor pastures, and that lime by itself is not an economical substance to apply.

There is another important point on which the result of these experiments agrees with the result obtained at Cockle Park, and flatly contradicts what is a very generally held opinion among farmers. In every case the feeding of sheep on Plot A with cake resulted in loss. The cake did not pay for itself in the increase it produced in the sheep, nor did it improve the pasture of the plot on which it was fed to any marked extent. All three experiments were quite consistent in giving this result. Also, as already explained, it is very much the result which might have been expected on land of the character of these plots. Nevertheless it is a very generally held opinion that there is no better or more economical method of improving pasture than by feeding cake on it to stock. It is probable that the results from cake feeding would be very different on land of a

different character, but we are quite justified in concluding that on poor moorish lands, and on much other poor hill land, the feeding of cake to sheep on the land will not pay, and will not improve the pasture to any material extent.

In all these experiments the effect of the phosphatic manures given on Plots B, C, and D has been to improve the pasture very markedly. Except on Naemoor, the sulphate of potash given on Plot C has had little effect, and in all three experiments the superphosphate and lime given on Plot D has not been so profitable as the slag alone given on Plot B. Generally speaking, Plot B, slag alone, has paid best.

In all three experiments the effect of the phosphatic manures has been long continued. The Plots B, C, and D, generally speaking, improved gradually for a few years after the manures were applied. After the improvement had reached its maximum it continued little changed for a few years. Even at the end of nine years after the manures had been applied their effect was not exhausted; indeed there was little deterioration in the ninth season from what the plots had been when at their best. This has an important bearing on the unexhausted values of phosphatic manures applied to pasture land. It is evident that in these experiments, even nine years after its application, 200 lb. of phosphoric acid per acre, whether applied as basic slag or as superphosphate, had left a valuable residue in the land, and had effected an improvement which would have been worth something very appreciable to an incoming tenant.

In his recent report, already referred to, Dr Somerville ascribes the long-continued effect of slag in large measure to the accumulation of nitrogen which takes place in the soil owing to the greatly increased growth of clover where slag has been used. This explanation does not appear to find any support from these experiments. It has been shown that cake feeding, the manurial residue of which is mainly nitrogenous, has produced little improvement, and that this was to be expected in soils so rich in humus and nitrogen as those of these experiments. We cannot therefore

ascribe the long-continued effect of the slag on Plots B and C and of the superphosphate on Plot D to indirect increase of nitrogen in the soil through their use, nor is it necessary to do so. Phosphate, even when applied as superphosphate, is not lost in the drainage to any great extent, except from very sour land. Practically the only removal of phosphate is in the carcasses of the sheep. But the total increases of live-weight made by the sheep in the whole nine years of the experiment only amounted in the best cases to about 800 lb. per acre. This would not have removed more than a small fraction of the 200 lb. of phosphoric acid originally applied. After the nine years of sheep feeding it is practically certain that a very large part of the phosphoric acid of the manure still remained in the soil.

On very rough pastures, such as those of Boon, cattle should be fed as well as sheep. Not only do the cattle help to improve the pasture for sheep by treading down and tearing up the rough parts, but they themselves make far greater increases in live-weight per acre than do sheep. So far as the results of these experiments go, they show that on pasture such as that at Boon cattle can make surprising progress on grass which is practically worthless to sheep, and at the same time improve the pasture for sheep.

As slag has shown so good a result on poor pastures in these and other experiments, it is very desirable that the still cheaper phosphatic manure which we have in ground mineral phosphates—such as Algerian phosphate—should be tried in similar experiments. In Algerian and similar phosphates we have a slow-acting insoluble phosphate combined with a considerable excess of lime. These experiments show that the improvement from the use of slag is effected only slowly: the fact that Algerian phosphate is insoluble and slow-acting would probably, therefore, be little disadvantage, while it has the advantages over slag of cheapness per unit of phosphate and of greater concentration, so that the cost of carriage and handling are less.

Summary.

1. The lime-phosphatic manures—(a) basic slag and (b) superphosphate applied along with lime—have in every case effected a marked and long-continued improvement on the poor pastures to which they were applied.

2. Basic slag applied alone has on the whole given the best return of all the manures.

3. Potash used along with basic slag has not generally paid its way.

4. Even in the case of basic slag, on an average three or four years elapsed before sufficient result was obtained to pay for the slag. On the other hand, the effect of the slag was not exhausted even after nine years.

5. Though a dressing of superphosphate and lime effected a considerable improvement, it did not pay so well as basic slag. The original cost of the dressing was greater, and on the average the return obtained was not greater than that from slag alone. The effect of the dressing was not exhausted in nine years.

6. The feeding of cake gave the worst return of all for the expenditure. In no case did it pay, either in the direct increase made by the sheep or in the improvement effected in the pasture. Generally speaking, very little result is recoverable on these soils from the manure residue of the cake used.

7. When the soil is covered with a very thick coarse sod of grass of poor quality, clover plants and the fine grasses have not room to develop, and the effect of the manure is shown only very slowly. On such pasture sheep alone are unable to eat down the grass properly, and better results are obtained when sheep and cattle are grazed on the same land. On such land cattle make far greater live-weight increase per acre than sheep.

8. In no case have these experiments shown the great and rapid improvement from the use of basic slag which was shown in the Cockle Park experiments.

VI

IMPROVEMENT OF ROUGH PASTURE, AS DETERMINED BY THE EFFECT ON STOCK—SOME SUBSEQUENT DETAILS.*

By Dr R. SHIRRA GIBB, Boon, Lauder.

WITH regard to the improvement of rough pasture ground, those who have noted the results of the ten years' "Manure and Mutton" experiment conducted at Naemoor in Kinrossshire, Sunderland in Selkirkshire, and Boon in Berwickshire, and reported on in the *Highland and Agricultural Society's Transactions* of 1905, page 271; 1908, page 269; and 1911, page 190, may be interested in the following particulars of the subsequent treatment of the plots at Boon, and of alternative schemes on adjoining land.

It may be recalled that for this grazing experiment five old hill-pasture plots of four acres each were measured off, as similar in soil and nature of herbage as it was possible to obtain.

A was a cake-feeding plot, B a slag plot, C got the same slag as B with potash in addition, D superphosphate and lime, while O was the control or "nothing" plot. The details of the experiment can be studied fully in the reports, but for the present purpose it may be pointed out that the slag plot B paid the dressing on the fourth year after its application; during the four following years the increased value of the grazing had paid for the slag and potash on Plot C, and for the superphosphate and lime on Plot D. The manurial residue of the cake consumed on Plot A had not been returned when the experiment terminated in 1910. After the fourth year the pasture on the superphosphate

* See *Transactions, Highland and Agricultural Society of Scotland*, vol. xxv. (1913), pp. 139-145.

and lime plot D continued to improve so much that when the weighing of the sheep was given up in 1910, it was keeping as many sheep, and in as fine and thriving a state, and producing as much mutton, as the Plots A, B, and C, which were considerably better to start with.

Before having the fences which had been erected round the various plots removed, it was thought that it might be interesting to see what results could be obtained from allowing the grass to remain unstocked and taking hay off it. The year 1911 was so dry that it was found necessary, owing to the general shortage of keep, to stock the ground, but in 1912 it was left unstocked, and the result of weighing the produce has been to place the weight of hay almost in inverse ratio to the production of mutton: A plot being 3 cwt. more than any of the others; B and C being almost equal, and about 3 cwt. better than D, which gave a short clovery crop of about 17 cwt. per acre.

The exact weight of produce was found to be difficult to obtain, owing to the greater unevenness of surface of some plots than others. Even on parts of the same plots, more "stubble" was left by the mower at some places than at others. Further, the season was so wet that hay-making of any kind was a difficult operation, and on some of the hay colls, when being weighed, there was more moisture than on others. The produce on the nothing plot O was not estimated.

The above weights, though not absolutely correct, may be taken as showing not more than 1 cwt. per acre of error. The meaning of the result is not difficult to understand: the plots benefiting most by the manuring, so far as the production of mutton was concerned, were those on which the white clover spread most effectually, whereas on Plot A—which had got nitrogen in the indirect form of the sheep-droppings, through the cake feeding—the growth of the moorbent and sweet vernal had been encouraged, and it therefore gave the heaviest weight of hay. The Plots B and C having more coarse moorbent, vernal, etc., than D—which in its turn had the most clover and softest herbage—were intermediate so far as weight of hay was concerned.

A continuation of the mutton test to see whether the 17 cwt. of finer hay on Plot D would have produced as much increase in the weight of the sheep as the 20 cwt. of Plots B and C, or the 23 cwt. of Plot A, was not found practicable, however interesting it might have been.

Farmers who have similar pastures will understand the position, to a certain extent, when it is pointed out that Plot D was the barer eaten in 1911, and that it was the moorbent (*agrostis*) that caused most of the roughness of Plots A, B, and C. Owing to the hardness and power of resisting decay possessed by that grass, it was found that the hay was not all the growth of 1912. It is, however, improbable that all the difference in the weight of produce was due to the amount of the withered growth of the former year. It is generally recognised that the greatest bulk is grown as moorland hay where the coarser grasses most predominate. Whatever the benefit of mere bulk—irrespective of its digestibility and assimilability for sheep and cattle, with their complex digestive systems—may be on the average of high-lying grassy sheep ground (heather ground is not here considered), it is probable that it is much exaggerated. The mere roughness has been considered of value for wintering sheep, and certainly may be useful in a snow-storm, a green blade being more easily obtained than when the ground is barer. An accurate observer, however, of sheep on natural ground in winter must see that they prefer the same grasses which they preferred in summer; and further, that what was indigestible and of poor nourishment or not very easily assimilated into the animal nature in summer, remains the same in winter, which means that rough pasture is not, merely because of its roughness, much good for wintering stock. Experience here is that an *agrostis* or moorbent pasture such as described (there is any quantity all over the country) is not much good in summer, autumn, or winter for either sheep or cattle, and that it is equally disappointing when ploughed up for a crop of grain. The strong mat of fibrous roots and the hard benty leafage are both too long in rotting to give a supply of plant-food in time for the first crop, and even

when top-dressed with nitrates, phosphates, and potash, the undecayed stuff seems largely to prevent the top-dressing from giving its full benefit. Therefore it does not seem to be much of an argument against improvement of high-lying benty pasture that a certain amount of the roughness is supposed to be valuable for winter food.

The field in which the experiment was conducted at Boon was 44 acres in extent. It was black-topped moorland, growing in 1874 very inferior heather. After being drained—drains 2 feet 9 inches deep and 20 feet apart being put in, with tiles in the bottom, and a foot of land-gathered stones or gravel above—it was steam-ploughed—a Sutherland plough, with a head like an anvil, which turned over about 18 inches at a turn, being found to be the best implement for the purpose.

Lime was then applied at the rate of about 4 tons per acre, and superphosphate at the rate of 6 cwt. per acre. Turnips were grown and eaten on the ground by sheep. No grain crops were taken, either before or after the turnips, but the ground was sown down with rape to grass—ryegrass and white and alsike clover being the seeding in those days. So long as the booming prices of half-bred sheep lasted, the sown-out grass paid well, but in four or five years the moorbent began to take possession, and eventually it occupied 90 per cent. of the surface, and accounted for almost the total herbage.

This was the nature of the pasture on which the manure and mutton experiment was conducted from 1901 to 1911, and also of the adjoining part, which was treated as may now be described.

The first operation was to plough about 16 acres, 6 to 8 inches deep, and as the turf was about twenty-five years old, the ploughing was no child's play either for men or horses. The work was done in the short winter days when the frost was so keen that other fields with a less thick covering were too hard. The plough was an ordinary short-moulded swing-plough with a specially wide feather, and with it about one-third of an acre was a good day's work for one man. This ploughing was done in January, and

nothing further was attempted till the December following. It was found that the heat of summer brought away a growth of grass at the edges of the plough furrows, and by September there was an appreciable quantity of sweet feed, which for two months kept more than one sheep to the acre. In December the sheep-treading had so firmed and flattened the furrows that cross-ploughing was possible, and in the cross-ploughed state it remained till after grain seed-time in the spring following, when it was harrowed, disced, rolled, etc., till the surface was fairly even and some sods at least fairly well pulverised. It was then ploughed again and the pulverising process repeated. One-third of a ton of ground-lime and one-third of a ton of slag were sown on it, and the turnip seed broadcasted over it with a grass-seed sowing machine set to sow 1 bushel per acre— $1\frac{1}{4}$ lb. of Fosterton hybrid turnip seed being mixed with 1 bushel of dried and riddled sawdust. The turnips, chain-harrowed and rolled in, needed no thinning and no hoeing. At least, if they needed or would have been the better of it, they got none. They grew well, were eaten on the ground by sheep, the crop in one part weighing out to 26 tons per acre, and at the worst part to over 14 tons, the whole averaging 17 tons of roots. After the turnips were all eaten the ground was ploughed, and in early June was again made into turnips with the same manure and lime dressing, this time, however, being drilled and thinned in the usual way, and a crop nearly as good as the broadcast one was again eaten on the ground by sheep. The ground was ploughed, and again, for the third time, got one-third of a ton of lime and one-third of a ton of slag, and was sown down to grass. The seeding adopted was, per acre—

9 lb. Perennial ryegrass.	$1\frac{1}{2}$ lb. Rough-stalked meadow grass.
7 „ Italian ryegrass.	3 „ Tall oat grass.
3 „ Timothy.	4 „ White clover.
$1\frac{1}{2}$ „ Smooth-stalked meadow grass.	2 „ Alsike.
	4 „ Rape seed.

The expenditure of this scheme works out per acre as follows :—

The first year—Ploughing only (in frosty weather, when no ordinary ploughing could be done).	£1	7	0
Second year—Cross-ploughing twice, harrowing, pulverising, etc.	£1	14	6
Ground lime and slag, 6½ cwt. each, applying, etc.	1	10	6
Turnip seeding, harrowing, rolling, etc.	0	2	0
Tear and wear of implements, sheep nets, attendance, etc.	0	10	0
Labour picking turnip shells	0	5	0
			4 2 0
Third year—Same practically as second year		4	2 0
Fourth year—Ploughing, harrowing, sowing down, etc.		1	9 0
			£11 0 0
Annual value before being ploughed—rent, taxes, etc.—say 10s., calculated for ten years.	£5	0	0
Interest on capital expended—say 10s. a year for ten years		5	0 0
			10 0 0
Approximate total expenditure		£21	0 0
Which is equal to 42s. a year for ten years.			

The income may reasonably be stated thus—

First year—Grazing on the ploughed ground, the grass growing between the furrows	£0	5	0
Second year—Crop of broadcast turnips, 17 tons at 7s. 6d.	6	7	6
Third year—Crop of drilled turnips, 17 tons at 7s. 6d.	6	7	6
Fourth year—Sown-out grass with rape: eaten Aug., Sept., Oct.	2	10	0
Fifth year—Luxuriant young grass	2	10	0
Average annual value per acre for the succeeding five years, 25s.	6	5	0
			£24 5 0

Equal to 48s. 6d. per acre a year for ten years, or 6s. 6d. a year per acre after deducting the 42s. expenditure above, while at the end of ten years the benefit is by no means exhausted.

For an investigation of a different nature, a third portion of the same field, about four acres in extent, had been examined botanically. In this examination the white clover was estimated at not more than 4 per cent., and even of that small percentage the plants were reported to be small,

with the running stem weak and thin. On this part of the field 4 acres were netted off in the winter of 1905-6, and 200 Cheviot ewes were folded on it for ten days, getting two cart-loads of yellow turnips, or say 25 cwt., per day. The residual value of the whole $12\frac{1}{2}$ tons would be equal only to that of a ton of dried grains, and the total phosphatic residue might not equal more than half a hundredweight of slag or $\frac{1}{8}$ th cwt. per acre. Yet the summer following there was a marked improvement in the appearance and growth of the clover. In the early summer of 1909 about forty sods, 6 inches by 6 inches, at regular distances apart over the 4 acres, were carefully washed and examined, when the white clover plants were found to exceed 12 per cent. Similar sods have been examined on various occasions since, when sometimes an increase had to be noted, sometimes a decrease. The wet weather of the past summer seems to have encouraged the growth of the coarse grasses, and the clover has been less in evidence than usual.

It does not necessarily follow that for every three tons of turnips per acre eaten on such a pasture, the number of clover plants would be increased three times. But it does seem as if the consolidation by the treading of the sheep, and the tearing up of the moorbent tussocks by the folding on in winter of a heavy stocking of sheep for a limited time, resulted in increasing the number and strength of the white clover plants far beyond what might be expected from the manuring got by such stocking.

To summarise the effects of the treatment here described, it would seem—

- 1st. That while the clover plants are spreading and developing—that is, in the early stages of their development—there may not be the same amount of nitrogen available for the use of the general vegetation that there is when it is more fully established. For instance, it might reasonably be expected that with the further development of the clover on plot D a heavier crop of hay might be obtained.

- 2nd. That where the old turf is very dense, where the

situation is suitable, and when the labour is available and the turnips can be profitably utilised, the method of improvement by ploughing, liming, and "slagging" as described above gives better results, over a limited number of years, than top-dressing.

- 3rd. That it is most probable that after applying a phosphatic manure as a top-dressing to a rough pasture, the folding on of a lot of sheep would hasten the beneficial result, and that the hastening would be in proportion to a great extent, to the amount of the treading.

VII

TOP-DRESSING PASTURES—SLAG, KAINIT, AND LIME.*

By Dr R. SHIRRA GIBB, Boon, Lauder.

THIS experiment, begun in 1898, was intended for hill grazings and pastures that had not been manured for a long time, if ever. In order that the manures should get well down to the soil, it was recommended that where the pasture was very rough or matted with old grass residues, these should, in the first place, where possible, be removed by cutting or burning.

The manures experimented with contained phosphoric acid, potash, and lime, but no nitrogen. They were applied with the view, among other things, of encouraging the growth of clover, for the purpose of eventually bringing nitrogen into the soil from the air. This being necessarily a slow process, it was desired that the reports of the

experimenters should extend beyond the first season after the application of the manures.

	SLAG. 1	LIME. 2
A		
KAINIT B		

The whole area of the experiment was about an acre—70 yards long and 70 yards broad—divided lengthwise into two sections, 1 and 2; and crosswise into two sections, A and B, as in the accompanying diagram, and manured as indicated.

Section 1 from top to bottom got Thomas slag at the rate of 10 cwt. per acre.

* See *Transactions, Highland and Agricultural Society of Scotland*, vol. xviii. (1906), pp. 80-93. Extracts applicable to Boon.

Section 2 from top to bottom got ground lime at the rate of 1 ton per acre.

Section A got no cross manuring.

Section B from side to side got kainit at the rate of 5 cwt. per acre.

The experiment was carried out by over twenty land-owners and tenant-farmers in different parts of the country, and to these the Society is much indebted for valuable assistance.

It was desired that the experimental area should be on a piece of pasture as uniform in character as possible, and the manures applied in calm weather so as to prevent their being blown from one section on to another, and that before applying the manures the sections should be marked out by means of pegs driven well into the ground and lines drawn between them by means of a cord or otherwise.

The effects of the manures were to be gauged by carefully noting any change in the nature of the grasses that might occur on each of the four plots, especially the relative abundance of clover and the bareness to which the grass was eaten.

In case the grass should be cut for hay, the produce of each of the four plots was to be kept separate, weighed as hay, and carefully-taken samples preserved for examination.

The actual amounts of manure supplied for this experiment were as follows :—

Section 1.	Thomas slag	.	.	.	5 cwt.
„	2. Ground lime	.	.	.	10 „
Cross Section B.	Kainit.	.	.	.	2½ „

It was intended that this experiment should have been reported on two or three years ago, but the much-lamented illness and death of Dr Aitken, who had charge of it, prevented this being done. At the request of the Science Committee of the Society I have gone over the various reports sent in by over twenty experimenters in various parts of Scotland, and I venture to think the results are sufficiently interesting to warrant their publication in the *Transactions*. I have endeavoured very briefly to note the

details reported of the various experiments, and have attempted to tabulate the results of the more interesting, and to draw attention to some of the conclusions which seem to me indicated more or less clearly by the experiment as a whole. In some cases the soil and subsoil have been analysed, and the results are introduced in tabular form.

BOON, LAUDER.

At Boon, I have myself conducted this experiment on four different parts of the farm. The first area tried in 1898 was in a twenty-five-year-old pasture field, on moory, black-topped soil, with a heavy, deep, and damp clay subsoil, tile-drained in 1873. The pasture was very rough and practically uneaten, *agrostis* largely predominated, only a few sickly clover-plants showing here and there; to compare with this a part of the moorland was pinned off, and the same manures sown. The prevailing grasses were *agrostis*, *aira cespitosa*, *festuca ovina*, *nardus stricta*, and sedges, with a little heather here and there. In 1899 two other plots were staked off. One on a thin, shallow, moory clay, with a very hard subsoil of reddish till. The grasses were poor and wiry, and generally vegetation was anything but luxuriant. *Agrostis* and sweet-scented vernal were the most prominent grasses, and what clover-plants could be seen were poor and sickly.

The fourth area was also on a clay, but of a richer, deeper nature, with a more gravelly subsoil. With the exception of the moorland plot, all these experimental areas show the same results to-day. The slag alone plots without exception were the first to show themselves, but not till the second summer, or eighteen months after the manures were sown; the lime alone coming on about a year later. Kainit has uniformly retarded the action of the slag and the lime, and only now, after about six years, when the sourness caused by the kainit may have disappeared, are these plots showing a distinct improvement.

The lime alone and slag alone plots are to-day very bare, and very little difference can be noted between them. The

results are most marked, and the plots generally require no pins to distinguish their whereabouts. The least improvement has been made on the moorland unbroken pasture, and I do not think the slight change noticeable is enough to encourage treatment of this class of land with manures. The plot on the clay with the gravelly subsoil is not so much improved as where the subsoil is more retentive. The whole of the plots are better now than they have ever been, and can be observed a long way off.

From an examination of the following table it will be seen that in six out of the thirteen reports the slag and kainit plot 1 B is the best, but that in four cases, namely at Glenbuck, Park Mains, Titwood, and Arngibbon, the slag alone plot 1 A is characterised as being almost as good. It is therefore probable that in these four cases the extra cost of the kainit has not been repaid. The slag alone plot 1 A is reported in five cases out of the thirteen as being absolutely the best. In these cases it would seem as if the addition of the kainit had in some way retarded the action of the slag; and at Drumtian, Craig of Neilston, and Boon this adverse action has been very marked.

The kainit, when combined with lime, has in six cases out of the thirteen produced better results than by the use of lime alone, while in four cases the addition of the kainit has again had a harmful effect—namely at Drumtian, Craig of Neilston, Boon, and Legerwood. That in the six cases in which the combination has given better results the kainit has repaid itself may be considered doubtful; probably it may at Newton, Inch, and at Glenfinlas.

On the more or less moory and black-topped soils at Glenbuck, Park Mains, Knockdon, and Boon the best results have been got by slag. On the first three places the kainit does not seem to have done harm, and may have done a little good. At Boon its use has been distinctly harmful.

On the clays and clay subsoils at Legerwood, Drumtian, Boon, and Craig of Neilston slag alone has done best, kainit having seemingly been detrimental.

At Kippo, in the East Neuk of Fife, where the soil is

SUMMARY OF THIRTEEN REPORTS.

Experimenter.	Nature of Soil.	Slag alone. 1 A.	Slag and Kainit. 1 B.	Lime alone. 2 A.	Lime and Kainit. 2 B.
Mr A. M. Gordon of Newton, Insch.	Good loam.	Fresher and greener.	Fresher and greener.	Little effect.	Best plot.
Mr Ch. Howatson of Glenbuck.	Black and mossy ; tilly subsoil.	A good second ; nearly as good as 1 B.	Best plot.	No effect.	No effect.
Mr Wm. Taylor, Park Mains, Renfrew.	Moory, and mixed with grey sand.	Second plot not quite so early as 1 B.	Best plot.	Little effect.	Better than 2 A.
Mr H. M. Leadbetter, Legerwood, Berwick- shire.	Clay, with clay sub- soil.	Best plot.	A good second.	Third best.	Little or no effect.
Mr James Allan, Drum- tarian, Killearn.	A strong blue clay, very retentive.	Best plot.	Distinctly inferior to 1 A.	A little improve- ment.	No effect.
Mr Alex. Cross, Knock- don, Ayrshire.	Black moory soil on clay subsoil.	Best plot.	Nearly equal to the best.	A little improve- ment.	Slightly better than 2 A.
Mr Osborne, Craig of Neilston, Renfrew.	A reddish clay on rocky subsoil.	Best plot.	Not much improved.	Second best plot ; improving.	Little or no improve- ment.
Mr Cairns, Glenfinlas.	Light sandy loam.	Good, with best clover.	Good ; nearly equal to 1 A.	Good ; well eaten.	Good ; best eaten.
Sir Robert Moncreiffe, Bridge of Earn.	...	Second best plot.	Best plot.	No change.	No change.
Mr Reid, Titwood, Mearns, Renfrewshire.	Light soil on whin- stone rock.	Nearly equal to the best.	Best plot.	Very little improved.	Barer eaten, but little clover.
Mr R. S. Gibb, Boon, Lauderdale.	Moory clay on tilly clay subsoil.	Best plot.	Improved, but very inferior to 1 A.	Very good ; almost equal to 1 A.	Not half the im- provement of 2 A.
Mr Nicoll, Kippo, Kingsbarns, Fife.	Strong cold clay.	Good, but inferior to 1 B.	Best plot.	No effect.	A little improved ; still poor.
Mr John Drysdale, Arm- gibbon, Stirlingshire.	Rough hill.	Almost equal to 1 B.	Best plot.	No effect.	No effect.

also a heavy clay, the kainit has been of distinct benefit, both when combined with lime and slag. It may be pointed out that the pasture at Kippo had for five years prior to the experiment been receiving annually a strongly nitrogenous top-dressing. The natural inference in this case is, therefore, that both potash and phosphate should do good.

On the lighter soils at Titwood, Glenfinlas, and Newton, Inch, the results seem to vary, from circumstances probably not having much relation to this experiment.

With regard to the seven plots on which no result from any of the manures has been recorded, it is possible that at Newton, Cambuslang, and Parduvine, near Gorebridge, as on the Gateside field at Park Mains, the soil was rich enough to produce full results without the addition of any manures. At St Colme's, Ballinluig, the close-tufted nature of the herbage, along with probably the gravelly subsoil, may have caused the absence of results. In Mr J. V. Lindsay's case the gravelly subsoil and the very dry summer may also be credited with the barrenness of result. It is less easy to account for the state of matters at Sunderland in Selkirkshire, at Crichness in the Lammermoors, or Langburnshiels and Monteviot in Roxburghshire. The soil and subsoil analysis of the Sunderland field show it to be in fairly good heart.

ANALYSES OF SOILS.

An examination of the table on the next page, giving the analyses of the soil of the seven plots selected by Dr Aitken, does not help much to a clearer understanding of the condition of these plots at the beginning of the experiment; and I do not feel competent to draw conclusions from the results as reported, when they are compared with the soil analyses. I may, however, suggest that as the soil at Drumtian seems to contain fair quantities of the manurial ingredients used in the experiment, the amount of iron oxide and magnesia, and the general denseness of the clay as shown by the absence of stones, may be the causes of its want of growth and its poor feeding properties.

ANALYSES OF SOILS.

RESULTS IN AIR-DRIED SOILS.									
	Boon.	Legerwood.		Park Mains.		Kippo.	Drum-tian.	Sunderland.	
		Black Hill.	Weens Field.	Gateside Field.	Moor Park.			Soil.	Subsoil.
Organic matter }	10.9	14.9	15.65	9.35	9.10	6.95	29.4	25.3	21.27
H ₂ O .	2.50	1.62	2.15	4.60	4.50	2.70	6.70	5.5	4.72
N .	.20	.28	.18	.14	.17	.13	.25	.28	.23
Stones .	9.78	55.13	4.89	8.71	27.72	5.17	1.27	39.72	62.86
NITRIC ACID SOLUTION (Strong-boiling).									
P ₂ O ₅ .	.12	.16	.10	.12	.11	.10	.11	.18	.21
Fe ₂ O ₃ .	1.00	2.98	1.65	1.52	3.33	2.63	4.61	2.56	3.40
Al ₂ O ₃ .	.86	1.85	5.09	1.83	1.27	2.14	6.40	1.85	3.21
CaO .	.20	.38	.27	.35	.25	.41	.38	.37	.26
MgO .	.59	.46	.65	.23	.18	.22	.83	.43	.50
K ₂ O .	.07	.13	.12	.03	.05	.06	.15	.29	.11
HYDROCHLORIC ACID SOLUTION—Sp. Gr. 1.15 = 30%, 48 hours in the cold.									
SiO ₂ .	.003	.006	.007	.005	.005	.003	.012	.008	...
P ₂ O ₅ .	.06	.07	.07	.08	.06	.06	.07	.14	...
Fe ₂ O ₃ .	.66	2.84	1.75	1.92	3.38	2.34	4.84	2.70	...
Al ₂ O ₃ .	.73	1.71	1.62	.74	1.32	1.16	3.13	1.51	...
CaO .	.16	.28	.10	.27	.05	.16	.45	.40	...
MgO .	.14	.04	.05	.04	.024	.02	.45	.18	...
K ₂ O .	.02	.04	.04	.01	.03	.006	.26	.06	...
CITRIC ACID SOLUTION—1%, 7 days in the cold.									
P ₂ O ₅ .	.032	.028	.021	.024	.010	.017	.016	.025	.028
K ₂ O .	.0017	.013	.008	.007	.021	.008	.012	.015	.009

At Kippo the results are quite what might be expected from the soil analysis. At some of the other places the usual anomalies occur. For instance, the analyses would indicate that the manures should be of more value on the Gateside field at Park Mains than on the Moor park, whereas the latter has shown excellent results from the dressings of slag and kainit, and the former none.

At Boon the amount of phosphate, citric soluble, was greater than at any of the other places, and the quantity of potash found was lower than most, whereas the experiment shows that phosphate in the shape of slag has done a great deal of good, but that potash in the shape of kainit has done harm.

I think the general lessons which may be learned from this experiment are :—

1. That on clay soils overlying strong clay or tilly subsoils, where the grasses are poorly eaten and clovers sickly, slag may be expected to do good. Exception must be made to this in cases where, as often happens when *agrostis* is very predominant, the sod is very dense and the roots thick and matted.
2. Where the soil is lighter and the subsoil gravelly, the wise course would be to experiment on a limited area before going to much expense in the purchase of slag as a top-dressing.
3. On moory, mossy, and generally on black-topped land, slag seems a most useful agent, and it is probable that a little kainit should be added.
4. It would seem that in every case it is advisable to experiment in a small way with kainit before applying it to a large area of grass-land.
5. When the grasses are very thick and the roots practically occupy the soil, it is doubtful if any manuring will pay. The cases at St Colme's and Langburnshiels, and the moorland plot at Boon, may be taken as examples of this.

I do not think that we have learned all that such an experiment as this is fitted to teach, and I think some of the plots should be watched for a time, and other experiments might be instituted to clear up some doubtful points.

VIII

TOP-DRESSING PASTURES—PHOSPHATE, POTASH, AND LIME.*

By Dr R. SHIRRA GIBB, Boon, Lauder.

AN experiment, conducted on over twenty different farms, was begun in 1898 to test the result of dressings of slag, ground lime, and kainit on poor pasture land. This experiment was reported on in vol. xviii. of the *Transactions* (page 80), and showed, according to the opinion of the experimenters who reported on it, very varying results. In some a wonderful improvement resulted from the application of slag, in others no beneficial effect could be traced even after some years.

The present experiment was started with the object of finding out the reasons why slag, as a phosphatic manure, should be so variable in its effect.

It was decided that it should be carried out in co-operation with the three Scottish Agricultural Colleges—and reported on by a representative of the Highland and Agricultural Society. The County Work Committees of the different Colleges were asked to select the plots on which the experiment should be conducted, the Highland and Agricultural Society to supply and pay for the manures.

The idea was that each College staff should select three soils as different as possible, in their own districts—probably a clay soil, a gravelly soil, and a black-topped or moory soil, and in parts differing in climate and probably other conditions.

The *West of Scotland Agricultural College* only selected

* See *Transactions, Highland and Agricultural Society of Scotland*, vol. xxiv. (1912), pp. 292-297.

one plot, and that on high hill pasture in the Strathaven district of Lanarkshire.

The *Edinburgh and East of Scotland College* selected three plots, which to a certain degree differ from each other, one being a good pasture on a gravelly loam in high condition on Deanfoot, Mr J. M'Hutchen Dobbie's Peeblesshire farm; another, also a gravelly loam, but lighter and more moory, on the southern slopes of the Pentlands, at Coates, near Penicuik—farmed by Mr Fleming; the third at Mr Crichton's farm at Aikendean, near Dalhousie, where other College experiments have been carried on.

In *the North*, three plots have also been selected, and are sufficiently far apart, one being at Shields, near Fordoun, in Kincardineshire; another at Dubston, near Alford, on Donside, in the centre of Aberdeenshire; and a third on the Highland Railway, near Kingussie.

The manures were supplied, after being tested, to the seven experimenters early in 1909, and were sown under the inspection of a member of the respective College staffs.

They were visited and reported on during the first summer by officials from the Colleges, and improvement on some of them was even noted then.

In 1910 the writer was asked to go round and visit all the plots with a view to reporting on the results. It was considered, however, that too premature a report might be misleading, so a further visit of inspection was made in July 1911—and the result as ascertained at these visits is now given.

From a meteorological point of view the two years 1910 and 1911 have been very different—the extreme drought of 1911 materially affected the appearance of the pastures.

In a general way it may be said the plots selected do not tend to elucidate the chief point of the experiment—namely, under what conditions is slag not beneficial. For as far as this experiment is concerned the point is still undetermined. On all the plots phosphatic manures have induced a distinct increase in white clover and in the general kindliness in the pastures.

The Lanarkshire plot, selected by the *West of Scotland Agricultural College*, is on high ground on one of the farms called Brackenridge, between Lesmahagow and Strathaven. This would seem in its natural state to be the poorest of all the seven selected areas, but one which from the very first responded to phosphatic dressings, in a marked way.

The ground was divided into eight sections.

					Rate per Acre.
Section A received.		Basic slag	.	.	10 cwt.
" B "	.	Kainit	.	.	5 "
" C "	.	Ground lime	.	.	1 ton
" D "	.	Slag	.	.	10 cwt.
		Kainit	.	.	5 "
" E "	.	Slag	.	.	10 cwt.
		Ground lime	.	.	1 ton
" F "	.	Kainit	.	.	5 cwt.
		Ground lime	.	.	1 ton
" G "	.	Finely ground Algerian phosphate			10 cwt.
" H "	.	Algerian phosphate	.	.	10 "
		Kainit	.	.	5 "

On sections A to F inclusive the manures were applied on 25th December 1908, and the Algerian phosphate on sections G and H was sown in the beginning of February 1909. Originally on this plot sweet vernal and moorbent were the prominent grasses, with some stunted clover plants, sections C and D probably showing most clover—generally the herbage was white and bleached and poor.

Even in the first season, 1909, a change was seen on sections A, D, E, which were greener and seemed better eaten. G and H also appeared greener in patches. Sections B and C were unaltered, and would appear as if they had gone back. This may have been only apparent owing to their comparing unfavourably with the others alongside that had improved.

When visited in the early summer of 1910, the improvement on the sections of this plot which had got phosphatic manures was most marked—A, D, E, G, H were most easily seen, and required no marks to indicate their boundaries. The lime on sections C and F seemed to be causing a little more growth, as they looked greener than the unmanured

parts of the field. In July 1911 the changes of 1910 were found to be emphasised—and on the slag sections A and E especially were the clover plants thickening up so as to give the prospect of a really good pasture. Section D, which had got the addition of 5 cwt. of kainit, was nearly as good as, and G and H, the two Algerian phosphate sections, were not a bit behind the best of the slag plots.

B, the section with kainit alone, was still very poor, and only a little better was the ground lime alone, on section C, while F, with both lime and kainit, was very little better than the adjoining untreated ground.

The effect of phosphatic manuring on this ground is most remarkable, and as there is a great deal of the same class of land in the district in which this farm is situated, it would seem that farmers occupying it might be interested in seeing the results, should they find time to give this plot a visit. Neither the lime nor the kainit alone or in combination seem to have paid the cost of their application. The best sections show an improvement equal to 60 per cent. over the adjoining pasture.

For the Edinburgh and East of Scotland Agricultural College one of the three plots—the plot at *Coates*, is situated on the south-eastern slope of the Pentlands, 1000 feet above sea-level, and has been in grass for about forty-five years. It got a heavy dressing of lime in 1875 (about eight tons per acre). The soil is a moory, gravelly loam. The manures were applied on 5th February 1909. During the first summer a difference was visible on the sections which got slag and Algerian phosphate. The visit in the summer of 1910 showed marked results, and in 1911, notwithstanding the drought, they were equally well seen. From a long distance the various sections showed different shades of green on the hillside.

Slag here seems to have done better than Algerian phosphate. Slag alone, and slag and lime seem to give about equal results, and slag with kainit and Algerian phosphate with lime are not much behind, while kainit and lime, either alone or in combination, do not seem to have made an improvement commensurate with the cost of their

application. The best sections easily show an improvement equal to 40 per cent. over the adjoining pasture.

At *Deanfoot*, near West Linton, the improvement is not so marked. The pasture here probably to begin with was better. The growth and freshness of all the sections was quite good, and the only points that may be noted are that the slag and Algerian phosphate have made the stock eat barer on the sections to which they have been applied.

It would almost seem as if so far the kainit here had done positive harm, and the lime has certainly done no good. It is difficult to estimate by a figure the improvement on this pasture by the phosphatic manuring, but it is enough to be quite noticeable.

At *Aikendean*, where the soil is heavy and wet, slag might be supposed to have been pre-eminently the most suitable manure. But the Algerian phosphate has all along looked rather the better—lime has had more effect here than on any other of the seven plots of the experiment, and on none of the plots is the detrimental effect of potash, or what the late Dr Aitken used to call potash depression, so evident.

Mr Crichton experimented in connection with the early trial begun in 1898, mentioned above, and at that time reported no result from the manuring. He will now probably agree that on the plot now being reported on, the slag and Algerian phosphate have produced a result equal to a 30 or 40 per cent. improvement over the unmanured ground adjoining, and that the lime has also done an appreciable amount of good.

The plots selected by the *North of Scotland* College Staff do not differ very materially as to quality of soil, and do not seem to have produced the same interest on the part of experimenters or the neighbouring farmers as they have done in the East.

The plots at *Shields*, near Laurencekirk, do not call for much in the way of a report. They are high-lying, with a north-westerly exposure. Owing probably to the rough nature of the pasture and probably the method of grazing, not much result is noticeable.

The *slag alone* section seemed barer eaten, but was distinctly patchy. No difference was to be detected on the potash section, while the lime sections were markedly improved.

It seems probable that with heavier stocking and barer grazing many of the clover plants which are smothered by the rank herbage would have room and encouragement to spread and develop, and the beneficial results of the slag and lime dressings, which are certainly even now to be seen, would become more evident. No Algerian phosphate has been tried here.

Of the North Country plots quite the most interesting are those of *Major Forbes at Dubston*, near Alford. The soil is typical of quite a lot of ground in the higher parts of Aberdeen and Banff shires. There was plenty of clover, though some of it not very robust, in the pasture before the manures were applied, so that the encouragement given by the phosphatic manures is very evident. Slag alone, slag with ground lime, slag with potash, Algerian phosphate with and without potash—are all practically the same, and two other sections on which superphosphate has been used are very little behind. Potash and ground lime both alone and together would seem also to have done good, and caused the herbage to be barer eaten by the stock. Whether their application has paid or not, Major Forbes may be able to say. At all events, it would appear that the phosphatic dressing has paid, and the improvement from it may be roughly estimated at about 30 per cent.

The plot at Mr M'Gillivray's, *Ballachroan*, near Kingussie, has been somewhat spoilt experimentally by being laid on across the hillside rather than up and down—it was also only in 1910 that any result could be noted. In 1911 it was so burned up by the drought as to be an even brown colour all over, from which no result could be traced. Potash here in 1910 had not done much good if any. Algerian phosphate alone seemed better than slag alone, but that might be because the section so treated was better situated; lime does not seem required, as on all the other plots phosphates do best, and alone. But it is questionable if

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GLOSSARY

affa, awful
 aftermath, second growth of grass & clover that
 comes up after the grass is out
 ane, one
 bannock, loaf scone
 bields, shelters
 bothy, place where unmarried men were put up
 braird, germinate
 brake, char-à-banc
 break, small, temporary enclosure
 bught, sheep corrall
 byres, sheds for milking cows
 callants, boys
 dinmont, 2 yr.old wedder
 dunts, lumps
 eild, barren
 ewe-side, female-side
 factor, agent
 fallow, anything cultivated between the drills
 fiar, assessor
 flake, hurdle; flake-gate, light gate
 gimmer, 1 yr.old ewe, ready to have first lamb
 glebe, small farm attached to manse
 half-waxed, half-grown
 hansel, present
 haugh, valley of a stream
 hind, ploughman
 hirsle, number of sheep that one shepherd looks
 after
 hogget, hogg, 1 yr.old sheep
 howk, dig
 jalousin, thinking
 kail, broth
 kebbled, skin-diseased
 kebbock, cheese
 lade, artificial stream
 laid ony, put on the scent (of dogs)
 mangel, kind of beet
 muckmidden, manure heap
 mugger, tramp who camps by wayside
 oo, wool
 outrun, good place for running out (for sheep)
 parrick, small enclosure for feeding sheep, on

policy, private park round a country house
sarking, boarding
shies, balls thrown at a mark for a prize
alaverin', frothing
soomed, swimmied
spate, sudden flood
spean, wean by separating completely
sprat, sedge
steading, farm buildings
stell, plantation of wood for shelter in a
certain shape
stirk, steer
stob, stake for a fence
strathspey, one part of the reel
swedes, Swedish turnips
swee, svey, crane

thirled, bound out to
unca-guid, literally, very good, thus, too good
waygoing, going away, going out
wedder, castrated male sheep
whins, firz bushes
wreath, drift (of snow-drift)
yin, one

